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ABSTRACT

The Innovative Teaching Group (ITG) at Cleveland State University, committed to novel and untried teaching methods, has organized papers from the faculty and other resource people into an anthology on teaching. After the general introduction, the contents are divided into three parts: Insights and Issues at Large; Strategies and Tactics in Practice; and Evaluating Instructional Effectiveness. The first section on teaching addresses itself to the broad-gauged consideration of teaching, including such topics as innovation, the modern student, and learning theories. The fifteen papers in section two speak in specifics about curricular and course design and instructional techniques. The third section contains papers presented at a conference titled "Faculty Development: Evaluating Teaching" sponsored by the ITG. The major goal of these papers was to consider and define the parameters of evaluating classroom instruction for the improvement of learning and for the professional advancement of the faculty. Papers in this section include: the feasibility of evaluation; analysis of roles of faculty by students, administrators, and faculty; and correlation between administrator, colleague and student ratings. (Author/PG)

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innovative teaching:

ISSUES, STRATEGIES, AND EVALUATION

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AN ANTHOLOGY BY
THE FACULTY

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THE CLEVELAND STATE UNIVERSITY

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INNOVATIVE TEACHING: ISSUES, STRATEGIES, AND EVALUATION

AN ANTHOLOGY BY THE FACULTY

JUNE, 1973

LANCE C. BUHL AND SAM H. LANE,
CO-EDITORS
THE CLEVELAND STATE UNIVERSITY

Published by The Center for
Effective Learning

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PREFACE

The editors are grateful to many good people who contributed to the creation of this anthology. Principally, of course, they owe thanks to each of the contributing authors who devoted time and energy to the initial compositional effort and then granted the editors an unlimited fund of patience while the book was put together.

A very special thanks must be paid to the Cleveland Foundation. Without its support, this anthology would still be awaiting final typing and editing. Like so many other products of the Innovative Teaching Group (I.T.G.) at Cleveland State, the anthology on teaching was finally made possible because the Foundation funded the Center for Effective Learning in November, 1972. Brainchild and heir of I.T.G., the Center enjoys a fiscal viability the lack of which hampered I.T.G.'s ability systematically to encourage instructional development here. In many ways, then, the completion of this tome is symbolic of what has happened to extend or give birth to much that was initiated or envisioned by the Innovative Teaching Group.

Finally, the editors wish to thank those whose skills in typing and editing make such enterprises -- like books -- readable. Specifically, our thanks are extended (many times over) to Jean C. Carr, whose superb editing increased the literacy of the work greatly and in a very English way, and to a triumvirate of typists -- Eva Czech, Gwendolyn Grady and Mary Kelly -- whose skills are exceeded only by their patience.

L.C.B.

S.H.L.

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GENERAL INTRODUCTION
THE EDITORS

About a year ago, the editors of this anthology were not editors at all. Neither did they own pretensions in that direction. But they were involved -- one as unofficial coordinator and the other as member of the Steering Committee -- in a rather unique, if unofficial, organization at Cleveland State. It was called the Innovative Teaching Group.

I.T.G. had begun in January or February, 1971, by a number of teachers in Arts and Sciences and in Education. To a person, they were committed to effective instruction. Most considered themselves innovators (hence, the name) but more often because their concern for the results of teaching was novel than because they adopted untried methods. At any rate, hardly anyone in the group was in contact with other like-minded colleagues. By dint of interesting and often active debate and of a sense of camaraderie, I.T.G. took hold, meeting regularly on a bi-weekly basis for the rest of the year.

Nothing earthshaking happened, it is true. Or perhaps something very significant did transpire: about forty faculty members had identified themselves as a steadfast core of "innovators" in the classroom. The Group was firmly enough entrenched at any rate that it decided to continue on a structured basis during the 1971-72 academic year. A Steering Committee was formed and a number of new ventures were launched -- a monthly newsletter, a formal lecture/seminar series on teaching, a subgroup on evaluation, a subgroup on an Interactive Teaching System, an all-University conference on faculty development. As each took hold and more faculty indicated their concern for effectiveness in the classroom, the idea occurred that it might be appropriate to organize the papers presented in the seminar series and those submitted at large from the faculty into an anthology on teaching at C.S.U. As usual, the response was encouraging. So the editors became editors.

That more than a dozen faculty responded so promptly to a general invitation to submit papers about their experiences in or thoughts on teaching is indicative of the sources of I.T.G.'s success. That is, faculty are anxious to devote energies to the teaching enterprise in a professional manner -- with as much rigor and according to the same ground rules as research demands. They are willing to document and evaluate their work in the classroom, to distill their data and thoughts and to submit the results to the critical review of colleagues.

Until I.T.G. was created there were precious few opportunities at C.S.U. for even casual exchanges among instructors about teaching. Some faculty wondered whether they were along in concentrating on teaching. The chances to communicate to a wider audience were even more limited. Most professional journals provide scant space and incentives for articles on teaching. A few disciplines either have or are developing journals specifically geared to teaching; they are important. But their audiences by definition are limited to the profession. Little in the way of transdisciplinary dialogue is stimulated. There are one or two transdisciplinary journals; but at least one of them is both new and international in appeal. The chances for publication are slim. While there are some in-house newsletters on teaching at various universities, their appeal is provincial and their space is tight. In short, academe has never really organized itself to provide the outlets necessary for the systematic development, documentation and communication of the teaching transaction. Given this situation, universities have been reluctant to reward teaching rather than research.

To a limited degree, the seminar series provided one vehicle for the presentation of ideas in a systematic way. The six papers prepared for the series last year have been included here. The editors also entertained the modest hope that the anthology might widen the opportunities for other faculty to document their efforts. Fourteen papers were volunteered as a result of our invitation last Spring. The last three papers partially document the events of I.T.G.'s first conference on faculty development last May, the special theme of which was evaluating teaching.

The third chapter deserves special mention. It was not clear at first that the papers of the resource people to the conference from outside the University ought to be included in this publication. As our thinking advanced, however, it became clear that the issue of evaluating -- as sensitive as it is -- must be confronted. Considerations of effective instruction are haphazard at best unless they include something about documenting effectiveness. Excellence in teaching can and must be demonstrated. It is not simply an intangible quality that some have and others may never acquire. Still, the salient characteristic of the third chapter is its concentration on the "politics" of evaluation. The chapter does not constitute a "how-to-do-it" manual. Perhaps, before faculties as a whole are able to consider serious, consequential evaluation procedures, they have to process the delicate questions about what evaluation means at the gut level. In that sense, the papers in the last chapter are extremely valuable.

As the papers for the first two sections or chapters came in, three patterns emerged. First, it became obvious that nearly all the contributors view teaching systematically. They regard particular techniques as part of whole cloth. Classroom instruction is not a haven for failed academic researchers; rather it is the testing ground for men and women who take seriously the notion that teaching still forms the central mission of public higher education. While some of the papers are based more firmly on first-hand impression and speculative reflection than on hard data, each is constructed with a view toward coming to complete terms with the challenges of teaching. As first statements of conclusions or positions, the collection is remarkable for its solidity.

The second pattern was not surprising but still gratifying. The papers represent most discipline areas -- business administrations, education, law and, in the Arts and Sciences, the three major subdivisions. As has happened so frequently in various I.T.G. meetings, teachers find that colleagues in disciplines quite removed from their own in content have a great deal pertinent to contribute in method. At a time when crossdisciplinary studies and cooperation seem to run into so many snarls in fact, perhaps frank exchanges about mutual teaching problems provide a good basis for breaking down imagined barriers between content areas.

Finally, the material that came in almost organized itself in ways that illuminated one or another aspect of teaching. The editors had to do very little in the way of forcing this or that paper into a strange category. The first four papers in the anthology neatly formed a coherent chapter about teaching as a general activity in the University. The intellectual tensions that enliven this first section were unintended and altogether organic. The second chapter is less neat and coherent perhaps but it has a cohesive quality. All its papers are concerned with the practical. How can we maximize learning in practice? What are the most appropriate learning environments and conditions for a particular body of students and a special body of information? How can we test out our results to know whether we have succeeded? Again, the editors found taht the material worked or fitted well by itself. Each paper stands on its own merits, yet related thematically to one or another.

Teaching as the central mission is - or should be - what public institutions of higher learning are all about. This anthology on teaching stands as testament to the widespread and serious commitment to instructional excellence at The Cleveland State University.

PART ONE

ISSUES AND INSIGHTS IN THE LARGE

PART ONE

ISSUES AND INSIGHTS IN THE LARGE

Inevitably, discussions of teaching at the University level take up philosophies of education. Differing approaches revolve around innovation, effectiveness, and learning. Each concept is vigorously debated. What is innovative teaching? Must teaching be innovative to be effective? Should we concentrate on teaching or on learning strategies? And each question and attendant controversy calls forth a veritable host of troublesome sub-issues. The continuing problem is that sub-issues become principal foci. The trees obscure the forest.

The first section of this anthology on teaching at Cleveland State University addresses itself to the broad-gauged consideration of teaching. Each essay in this section attempts to take the measure of the entire forest or at least to describe the major types of flora which compose it.

The four authors--Professor Carlton Qualey of History, Professor Lee Gibbs of Religious Studies, Professor David Santoro of Education, and Professor Dale Brethower of Psychology--have a common commitment. They seek instructional excellence. Perhaps effectiveness is the more apt noun. Surely instructional innovation, as a goal in and of itself, is not the objective of any of them. Beyond this mutual agreement, the four divide into two distinct schools of response to the problem.

Qualey and Gibbs stand as representative types. Like most faculty concerned with the quality of the educational experience, their approach is intuitive. Their convictions about the essential conditions for effective teaching have matured through long, first-hand experience in the classroom. For them, the focus is the teacher. What, they ask, are his responsibilities? What can he or she do to insure quality and meaning for students? While the answers Qualey and Gibbs advance are not explicitly or directly based on research into formal learning theory, they are insightful and provocative. Together, the first two essays set a tone appropriate to the seriousness of the issue.

Professor Qualey, clearly, is sceptical of innovation. Indeed, the *dicta* he delivers at the end of his first paragraph raise the question whether the teacher can do anything at all with or for students whose skills and intrinsic motivations are not as well honed as those of the nation's very best undergraduates. This note, however, is merely a caution. Qualey's main concern has a more positive point to it. He calls all university teachers to very high standards of performance. Those who do not pass close inspection as good classroom teachers must not receive tenure. Qualey is unforgiving in his low regard for gimmickry and for teachers who are not researchers. His stance is based firmly on the conviction, however, that most, if not all, students recognize and respond to tough intellectual standards, and that innovation, loosely used as a cover for ineptitude, must not be condoned. He does not reject innovation. He insists only that it serve excellence. These challenges are well taken. They recall for us the verities which Qualey's forty years of teaching experience have confirmed. Those truths must inform today's interest in innovative techniques.

Professor Gibbs identifies unreservedly with innovative trends in contemporary teaching. Teaching he argues, must have an immediacy if it is to be effective. Teaching must relate directly to a generation of students who question the basic tenets and *modus operandi* of the academy: the lecture mode, historicism, value-free inquiry and the separation between thought and action. Gibbs wonders whether the traditionally trained Ph.D. can possibly meet this challenge from the contemporary or sensuous student. The instructor is already strung-out as a result of severe struggles within the profession between academic Left and Right, between advocates of tradition and of experientialism, of research and of teaching. If he relies solely on his limited training in teaching, he must fail. In order to save the "wounded enterprise" of the university, the instructor must move to new conceptions of liberal education, of knowledge and truth and of the student as a total being. He will, as a result, abandon traditional classroom modes in favor of structured innovation. One may ask whether the student type, which Gibbs describes, inhabits to any significant extent the public and especially the urban commuting university. It is probably true, nevertheless, that most faculty, regardless of institutional affiliation, have felt and responded to the hot breath of the counterculture student. Gibbs's challenge to us is to respond creatively and generously to new student expectations; like Qualey, he asks that we make the classroom a center for real intellectual communication.

Professors Santoro and Brethower consider the problem of education from a different perspective. Both are trained students of learning theory; both are researchers into the learning process, as well as classroom practitioners. Consequently, and significantly, they emphasize learning rather than teaching as the critical focus for attention and the final measure of instructional effectiveness. And, although their perspective is as broad as that of Qualey and Gibbs, Santoro and Brethower introduce a more sanguine note about the possibilities for improving learning. Indeed, both would object strenuously to the implication housed in Qualey's piece that there are good teachers and bad teachers and little can be done to transform the latter into successful practitioners. If we concentrate on student learning, they argue, each of us can take steps in his own classroom to increase learning in measurable ways. In the process, of course, one becomes a better teacher. Rather than implore, however, Santoro and Brethower prescribe concrete tactics and strategies which instructors can apply in the classroom.

Santoro separates the problem of instructional effectiveness into four manageable sub-problems: What is learning? How can we assess it? What can be done to promote it? How can we measure it? Traditionally, he argues, the principal models of education--the mental-discipline, the experimentalist and the mental-hygiene models--either have confused the issues or have been unable to answer any one of them satisfactorily. The reason for this failure is that each model takes the student as the terminal object or the end product of the educational process. What we must do instead is to recognize that skill acquisition (the "functional ability to perform a specific task") is the goal of education. This is the "legitimate behavioral phenomenon of classroom learning." Once we accept that, Santoro concludes, we can construct "a comprehensive, logical and integrated model of educational practice for describing, assessing and treating basic learning phenomena." This model provides for the social factors which impinge on rates of skill acquisition and it allows individual instructors to arrange the classroom environments, including their own role(s) in it, to maximize learning for each student. The implications of Santoro's theoretical statement are many. The most significant of them may be that, if teaching is an art, it must have some very precise operational features in order to be successful as well as aesthetic.

Professor Brethower reinforces Santoro's argument. His paper, plus the critique and commentary that were engendered when he delivered it to an Innovative Teaching Group Seminar a year ago, suggests that the body of research on learning is already complete and precise enough that, were instructors to utilize its precepts in their own teaching, they would work a "revolution" in higher education Brethower provides, as minimum organization for the event, a six-step schema that every instructor, regardless of discipline, can adopt to stimulate measurable learning: (1) State instructional objectives clearly, (2) devise testing instruments which are geared to those objectives, (3) devise study material that encourages students to perform tasks directly relevant to those objectives, (4) employ classroom methods which maximize student participation in approximations to the final objectives, (5) provide examples and non-examples of ways which the objectives are and are not met, (6) design mechanisms so that students obtain frequent and immediate feedback about their progress. Each of these precepts is based on valid experimental research. In short, Brethower, like Santoro, calls for the systematic examination and reorganization of instructional methodology by each teacher in order to foster learning, the principal object and basic rationale of higher education.

It may well be that the differences in emphasis among the four authors in this section between teaching and learning is more apparent than real. Both Qualey and Gibbs demand that instructors respond to and stimulate their students in intellectually respectable and valid ways. They call for excellence. Santoro and Brethower argue that such energy can be channeled in measurably effective ways. They give precise definition to standards of excellence.

INNOVATION?

Carlton C. Qualey*

One has the feeling on listening to purportedly innovative ideas and experiments that "this is where I came in". The ideas and experiments are much the same as those attempted in generations past, expecially in the 1930s. After thirty-six and more years of teaching history in both experimental and conservative institutions of higher learning, I have concluded that two ideas have been especially useful. One was given me by a president under whom I was privileged to serve: "We hire faculty for our best students." The other is an old concept: "A university is where university work is done."

These two ideas do not exclude innovation, but they do involve high standards of performance by faculty and students, expecially by the instructor. The matter of standards is always troublesome. Granted that there are no absolutes, it is nevertheless possible to insist that in each of the university disciplines certain levels of mastery and understanding must be maintained. The higher levels, the more distinguished the university. It will be said that standards are relative; that one must take into account the background of the students. To this it can be replied that if the students cannot meet the standards they should not be in the university. Actually, no matter what the quality of background of the students, I have found that students deeply resent lowering of standards to fit their supposed poorer preparation. They want quality, and woe to the instructor who does not recognize this fact. No amount of classroom entertainment or fraternization can cover up lack of genuine scholarly standards.

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*Visiting Professor of History during the year of 1971-1972 at Cleveland State University.

Students very quickly find out whether or not an instructor really knows his subject. They sense it by his security in fielding questions and by his finger-tip knowledge of bibliography. They find out by checking out what the instructor says. If the instructor is merely repeating the textbook, the students will stop attending. They further test the instructor by the kind and quality of his examinations. Through secondary schools most students have been accustomed to objective examinations. They know what it takes to achieve grades. It is a kind of gamesmanship, and rarely has much connection with genuine learning. When students encounter essay questions or problem-solving test situations, they are challenged. The good ones will come through. Again, however, it depends on the nature of the questions asked or the problems to be solved. And again it is the instructor's quality in making out the examination that comes out. It is extremely difficult to make out good examinations. The possibilities of misunderstanding are endless. But the examination can be one of the best instructional devices available if it is not used punitively. The students quickly sense the instructor's intent, and they are good judges of fairness.

Once the instructor has survived the first weeks of testing by the students, a condition of trust should develop. This trust is essential and must be established before a proper learning situation can be created. When the element of trust is there, communication, without reserve, can be expected to develop between the instructor and his students.

One vital element in communication between an instructor and his students is the intangible quality of genuine scholarly enthusiasm. I do not beleive that one can be an effective teacher unless one is also engaged in productive scholarship. The students in any class soon find out if an instructor is only one jump ahead of them and is merely rehashing secondary material. They become excited when an instructor can, in effect, create his subject in the classroom. Communication involves, of course, command of language, felicity of phrasing, a degree of wit, and ability to say the same thing in varying ways until comprehension is established. Effectiveness of communication is measured by responses, either in the form of questions and discussion or in essay examinations. Ideally a class should be small enough for full communication to take place. However, even in a large class or lecture, communication can be established if the components described above have been secured. I have been in large lecture groups in which the tensions of excited communication have been high. I have also seen small groups that were dead as could be.

Unfortunately there are men and women who should not teach. Industriousness has brought them through graduate school; recommendations have brought them to university appointments; and the protection of classroom sanctity has prevented their discovery by busy chairmen or deans. Only when they are notoriously bad has their ineptitude been brought to light before tenure is conferred. Then there is that bane of all colleges and universities, the person who regards teaching as the price paid for research facilities. Most unfortunate are those who can neither teach well nor produce anything worth publishing. The really able teachers in any department are usually few in number. They are not necessarily those with huge classes which often indicate either a "pipe" course or a required one. The really good teachers can be detected by the number of able students who seek out their courses.

Much ink is being spilled these days in the matter of tenure. The American Association of University Professors has traditionally maintained that tenure is essential to academic freedom, that is, freedom from unreasonable interference with research and instruction. Probably a college instructor is no more sacrosanct than members of other professions. On the other hand, tenure does give some security, and this is perhaps necessary to unworried endeavor. If one takes the latter line of thinking, tenure can be a constructive device. The catch is that the instructor's endeavor shall be of sufficient quality to warrant protection. No really satisfactory arrangement has been proposed. Permanent tenure from the time of early service seems to be going out of favor. Contract tenure seems somehow mechanical and is open to abuse. Student evaluation has yet to be proved reliable, except perhaps in single courses. One comes back to the principles first stated. After a preliminary period of perhaps three years, it should be clear to a vigilant department head or departmental committee on tenure whether or not an individual is worthy of probationary tenure, say of five years. Final determination of continuous tenure would then be made. Within these eight years there would be opportunity for interim evaluations if needed, thus giving ample time during an instructors marketable age for search for a position elsewhere. In any case, innovation or none, mediocrities need not be retained.

The use of gadgetry in the classroom has always been controversial, but some is undoubtedly useful. Audio-visual aids are available, computer aids are now commonplace, demonstrations are an old standby, field trips are appealing, and exercises of infinite variety are possible. However, such things can become mere entertainment or a means of using up required instructional time. One always comes back to the problem of basic understanding and of intellectual excitement.

Then there are the variations of organization of a classroom of students: committee of the whole; panels of five or six; teams taking portions of subject matter; self-evaluation (an extremely hazardous device); research papers, etc. I doubt that there is any program that has not been tried somewhere. I know I have tried a great variety of them. Eventually one comes to certain ways of doing things in the classroom *that work* for one's self. One comes by this knowledge painfully and after a good deal of experience. The able instructor will come to it fairly quickly and will continue to experiment. The mediocre will not succeed in any of the experiments.

Innovation in the hands of a truly promising instructor can be very beneficial. The lesson should be obvious. The emphasis must be on recruitment of able scholar-teachers, on making conditions for them that will promote their efforts, and on rewarding them with tenure and promotion. Tenure should not be given unless earned. The rule is a very tough one, and it makes the life of a department chairman at time a bed of thorns. But how else can a university do university work and achieve excellence?

THE SENSUOUS STUDENT AND THE STRUNG-OUT PROFESSOR

Lee W. Gibbs *

Living and working in a university, perhaps the most disturbed institution in a society showing all the signs of acute cultural crisis, is not very comfortable. Yet, as with every other aspect of the present cultural situation, this one is full of great danger and great possibility. It may be helpful to point out some of the basic tensions and conflicts which some of us with brief tenure in these institutions feel, having so lately left the ranks of students and having learned of faculty unrest.

In writing this paper on innovative teaching, I have tried to steer a course between abstract generalities that only repeat what others have already said and concrete personal observations which will not interest or help others. The paper is divided into three major sections; the first two are analytic and diagnostic, while the third is practical and constructive. The first section is an analysis of the nature and implications of the current student protest against a tradition-bound academic institution. Section two sets forth three areas of tension and conflict precipitated for the sensitive and dedicated teacher by student pressure for educational reform. The third section suggests three methodological presuppositions which may be used to legitimate innovative teaching and to build bridges between conflicting interests of students and faculty members.

I.

Many intelligent and sensitive students who have been caught up in their own cultural revolution have now been protesting for several years

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against what they believe to be the bankruptcy and immorality of the present educational system. They are in rebellion against an educational system which they perceive to be intent on making them conformists to an outdated social order. The contemporary student challenge to tradition-bound academic institutions includes the following intimately related but distinguishable constituents: (1) a critique of the excruciatingly boring and relatively ineffective lecture method as the primary mode of teacher-student communication in an age determined by electric media; (2) an anti-historical bias which is oriented away from the past toward the possibilities of the future and especially to the meaning of what is happening at the present moment; (3) an attack against the detached, objective stance which is nurtured by the whole intellectual style of supposedly value-free universities; and (4) a commitment to the unity of thought and action.

Critique of the Lecture Method

The present generation of students is not inclined to accept anything without question. Nevertheless, lectures still dominate the typical classroom as the primary mode of teacher-student communication. This instructional technique emphasizes almost entirely the rational, conceptual, and verbal level of communication at the expense of all others. The lecture symbolizes the old top-down, hierarchical structure of teacher authority and student dependence. The professor-lecturer, rigorously trained to be an abstract intellectual, tends to regard and treat himself and his students as detached minds without bodies. Students raised on the "cool" participational knowledge of television and other electric media are no longer stimulated or satisfied with the "hot" knowledge of the traditional classroom lecture. Especially in the present atmosphere of social crisis and urgency, students care little for generalizations spoon-fed to them for purely abstract reasons. They demand to see concretely and humanly why they are important.

The rigid asceticism, sublimation, and repression of bodily energy and emotional drives required on the part of the normal student as he endures the ordeal of passively sitting through a lecture which bores him to tears is relieved only by the final ringing of the bell. Radical students are now raising the question about whether or not the price of such sublimation and repression is too high. They are asking for new curricula and new pedagogical techniques which will move the emphasis in the classroom from conceptual abstractions to concrete human beings with their concrete bodies and repressed desires and feelings. The student criticism of dehumanizing, disembodied abstractions is part of a general romantic protest against "the fallacy of misplaced concreteness", a protest on behalf of the living body as a whole. Students are now insisting upon the recognition that there is an undeniable sensuous, ecstatic, Dionysian element implicit in every human body, in all human cognition, and in all the events cognized by human beings. Students are demanding an educational process which will not only change their thinking and behavior but also their sensing and feeling--that is to say, their bodies and their awareness of their bodies.

The Anti-Historical Bias

The spiritual revolution which is taking place among today's youth is marked by a decisive contempt for the past. Whereas the traditional university has regarded itself as a treasure house and transmitter of human wisdom carefully accumulated and preserved from the collective experience of the human race, student radicals have acquired an active prejudice and out-right hostility toward the past. Some extremists actually advocate deposing all their professors and locking up all the libraries--all in the interest of gaining a truly relevant education unblurred and unhindered by history. Not long ago, while speaking with one of my more radical students, I asked him where he planned to find the purified wisdom he was seeking. The student responded: "We of the younger generation will get it from one another. And each of us will contribute his share from here"--and he patted his heart.

This attempt to flee or escape from the oppressive responsibility of the historical past appears in at least two different modes. The first derogates both past and present for the sake of the future. Here the past is opposed mainly because knowledge of the past is believed to prevent contemporary men from expecting or creating a new future. The second opposes the past because it believes that bondage to the past prevents contemporary men from enjoying the present and seeking for the meaning of what is happening at the present moment. But in either mode, the human past is viewed as an obstacle to human fulfilment--a barrier to be demolished.

The Attack Against Objective, Value-Free Universities

The current student generation is well aware that modern civilization faces the severest political, moral, and ecological emergency in its history. Students raise their voices in protest against what they feel to be the inhuman, insensitive attitude of modern science in both its theoretical and applied fields. The objective, detached outlook, nurtured by the whole intellectual style of supposedly value-free universities, mercilessly eliminates enjoyment from man's relation to nature and promotes an aggressive, dominating attitude toward reality. For these students, the Viet Nam War symbolized in America what seems most dangerous to the world--its high level of science and technology and low level of wisdom and moral discernment. The war is for them the most highly rationalized and detached war ever fought and yet the most savage. It demonstrates how reason and civility can cover technological enterprises laden with destructive, demonic implications. Yet, in spite of the complicity of most universities in perpetrating the detached, objective outlook of modern science and technology, many students have not completely given up on the universities and are still seeking to find in them a haven where they can freely think and speak about ultimate questions, moral values, quality of life, the meaning of human suffering and hope.

Commitment to the Unity of Thought and Action

One final observation will help to illumine the present conflict of students with the universities. The separation between thought and action, which university life enforces, seems to the students illegitimate. Faculty members are professionals in the realm of thought. They move on occasion from thought to action and back to thought again. Students, on the other hand, customarily see their goal as action. They move on occasion from act to thought to act again. Thus, while faculty enthusiastically promote programs of continuing education in which those working in the field are brought back from action to thinking, students keep pushing for more attention to the kind of thinking that issues in action. They are impatient with the fact that a university is a place where thought issues only in further thought, talk in further talk, answers in further answers. They are convinced that awareness grows only through conscious, accurate action.

II.

The student pressure for academic reform and innovation places the sensitive and dedicated teacher in a very embarrassing and painful position.

The young doctoral candidate gets his Ph.D. and goes out to teach. Then comes the shock--courses to prepare and worst of all, students. He quickly discovers how untrained to teach and how incredibly ill prepared he is for the tasks now facing him. The young teacher quickly finds himself caught up in three areas of conflict where the opposing sides continually bid for a kind of total allegiance to one side or the other. These three conflicts arise between two kinds of anti-intellectualism, between tradition and experience, and between research and teaching.

Anti-Intellectualism of the Right and the Left

The anti-intellectualism of the academic right is the province mainly of university faculties. They consider that authentic knowledge and truth are exhaustively manifest in the accepted and well defined academic fields. Anything outside the fields of high competence represented by a given faculty could not possibly qualify as serious academic study. Any who challenge the system are *ipso facto* judged to be anti-intellectual.

The anti-intellectualism of the academic right has been undergirded by the unnatural divorce it imposes between personal experience (subjectivity) and rational analysis (objectivity). The "myth of objectivity" holds that there is but one way of gaining access to reality, namely, to cultivate a state of consciousness cleansed of all subjective distortion and all personal involvement. Only what derives from this objective state of consciousness qualifies as knowledge.

The exclusiveness of this view of knowledge as the ruling dogma of the university has been especially damaging to the humanities, and hence to the healthy tension that should exist between the value questions inherent in these subjects and the supposedly value-free pursuit of objective knowledge. This myth has not only narrowed the scope of legitimate questions to be raised but also has tended to support as inviolate those methods, disciplines, and subjects which the student finds entrenched and imposed when he arrives.

The second kind of anti-intellectualism is found among many of the more activist students, who use various rationalizations to avoid learning how to think well and clearly, and/or to avoid thinking about anything that does not appear personally relevant upon the day of arrival upon campus. The attack on objectivity tends to become an extreme and unjustified attack on all research and all intellect. Intellect alone is not going to save the world or civilization, but neither will be worth much without it.

The sensitive professor is torn between what is construed as intellectual rigor on the one hand and a reformed educational system characterized by contemporary relevance and good human relations on the other.

Tradition versus Experience

Most universities are characterized by the programmatic refusal to encourage unity between the storehouse of traditional material and the fresh data of present experience. The university and its faculty tend to compartmentalize these, aided by the notion of objectivity discussed above. The student is asked to lay aside the imperious questions and impulses of his experience and to enter the classroom with his mind a blank slate so that he may absorb as much of the academic apparatus and tradition as possible. He is also expected to learn to achieve detachment and objectivity. Wise and cynical students have observed that this means learning to depersonalize and detach oneself from his own favorite problems, predilections, and prejudices only so that he may subject himself to those of his professors. Once inside the classroom door, he cedes to the professor the right not only to provide guidance toward the right answers, but even to decide which are the right questions.

University faculty tend to be a bookish lot. They tend to equate relevant data with literary texts, and competence with bibliographical prowess. This confining of the definition of relevant data to printed books and articles (especially foreign language ones) tends to make a fetish out of the current state of scholarship, leaving aside the question of the relation of the current state of scholarship to the human situation.

The sensitive professor is torn between the questions and answers being dealt with in the classroom and those actually being struggled with in the world outside.

Research versus Teaching

Although the question of research is now well worn, it still merits further consideration. First-rate universities insist upon maintaining a vital relationship between research and teaching. But these two activities now imply an in-depth conflict when translated from abstract doctrine to practice in the real world. The conflict can be seen by looking at the two competing constituencies to which the faculty member must answer--constituencies which have very different expectations and criteria of acceptability. The two constituencies are the professional scholarly societies and the students. The situation is further complicated by the fact that both constituencies call for unqualified loyalty and represent values to which the teacher is firmly committed. It is not only an external conflict for allocation of his time but also a contest within himself.

On the one side, the professional society is the scholarly peer group of like-minded and similarly trained practitioners of each academic field. By means of such an Establishment, standards are indeed maintained through meetings and publications, and "the present state of research" on each issue can be authoritatively identified. All discourse at these meetings (as in reputable journals and books) takes place on a single level of awareness in a circle of scholars who accept each other's presuppositions and standards and characteristically refrain from challenging the basic assumptions upon which all are operating. The leaders of the professional society are the leaders in the field, being the same people who advise the most prestigious academic institutions and the most reputable publishing houses and journals as to worthy candidates for hiring and worthy manuscripts for publication. This mandarin system undeniably maintains high standards of technical excellence, but it also reenforces an exceedingly high degree of intellectual conformity.

On the other side, there are the students who demand good teaching and a genuine concern for themselves as individuals. They expect faculty to take the time to discuss outside of the classroom their intellectual and personal interests and problems. The young teacher usually finds that he has been better trained in his graduate program for producing scholarly articles in order to gain tenure, move upward, and become one of the top establishment people than in handling the daily grind of teaching and counseling students.

The professor finds himself torn between the evaluation of his professional peer group, which evaluates his performance on the quantity and quality of his research and publication, and the evaluation of students, who think most of their professors are lousy because they spend much of their time doing research and publishing rather than teaching. When the professor finds out that university administrators are listening carefully to both colleague and student evaluation for the purpose of making hiring and firing and/or promotion and tenure decisions, there should be little wonder that he tends to be seriously threatened by any kind of evaluation--colleague, student, or administrative.

III.

The teacher finds it most uncomfortable to be caught in the middle of the tensions and conflicts presently inherent in his profession. The seemingly implacable demands from opposing sides in these various conflicts give rise to feelings of schizophrenia. He yearns for the calmness of spirit and absence of distraction needed for fruitful intellectual work, but he also aches for the world that needs changing. Combat weary, he is tempted to seek escape by settling into one camp or another, to settle down in a fixed position and quit hearing the others, to stay out of the crossfire as much as possible.

Yet it is of vital importance that this temptation of choosing in an either/or fashion be resisted. The possibility of healing the wounded enterprise of contemporary education in the universities demands that the conflict-situation in which the teacher finds himself must be suffered through and somehow resolved on a higher plane than most have been able to reach. Meanwhile, it remains to keep open--within the bounds of reason, conscience, and sanity--to all sides of a schizoid situation. The remaining part of this paper attempts to promote a partial healing of the educational process by suggesting three methodological presuppositions which may be used to legitimate innovative teaching and to build bridges between conflicting interests of students and faculty members. All of these presuppositions imply less authoritarian modes of structuring and teaching classes and a decisive movement toward self and peer-group learning and evaluation.

The three presuppositions which can be used in an innovative teaching program are as follows: (1) a broader conception of the nature and purpose of liberal education; (2) a broader conception of knowledge and truth; and

(3) a broader understanding of the student in his totality as a psychosomatic organism.

A Broader Conception of Liberal Education

All of the problems of pedagogy relating to educational courses and programs ultimately rest on a broader decision concerning the nature and purpose of a liberal education. As a tentative, working definition, let me propose the following: a liberal education is an initiation both into the specific subject matter of the traditional academic disciplines *and* into the mysteries of human existence. This recognition of the part played by education emphasizes the fact that cognitive reality--which is only one human good among others--may be monstrously destructive unless it exists in the context of moral and aesthetic sensibilities. The purpose of a liberal education is to help the student learn how to continue to learn as the main purpose of life. If learning is conceived of as creative change in the student's thinking and behavior, education in this broadened sense can become an exhilarating, lifelong pursuit. To go on learning and sharing knowledge with others may well be considered a purpose worthy of mankind.

An essential part of the change in the thinking and behavior of the student induced by education is the formation of increasingly free agents who can make morally responsible decisions between alternative courses of action. Implicit in the very idea of freedom is an inward commitment to truth. The student preparing for freedom must throw away the crutches of dependence on teachers and course outlines. The authority of the teacher must diminish proportionately as the student matures in the exercise of his freedom.

The view of the nature and purpose of a liberal education makes active student participation indispensible in the process both of planning and running their classes. Especially in higher-level undergraduate and in graduate courses, more and more classes should be largely self-taught by the students--both in terms of self-instruction and of participative education in peer groups. Students maturing in the exercise of their freedom also have an increasing right to be evaluated by their peers and by themselves.

When the primary responsibility of thought and action is thrown on the student, the teacher consciously risks manipulation and abuse of his trust. The student with his new-found freedom finds himself the victim of a divided or ambivalent will. He genuinely desires to have the freedom to choose the subject matter he investigates, and to have a greater role in determining how to study it. But freedom implies responsibility and involvement, and this means time, effort, and devotion to the subject matter. The student is, therefore, divided against himself. He genuinely desires freedom in the educational process, but he also hates what this freedom implies and will make up any plausible excuse to avoid it.

Nevertheless, the teacher must himself be free and secure enough to take the risk of promoting the active participation of students in planning and running classes. He must continue to act hopefully upon the unverified premise that "there is good in every student." He may not get very far in his efforts, but he will more than likely find that his every effort is substantially rewarded.

A Broader Conception of Knowledge and Truth

There needs to be an attack on the popular positivism or scientism and the philosophical rationalism which claim that scientific knowledge and logical conceptualization are the only truths that now exist or ever should have existed. This argument should not by any means be construed either as an attack against science and its technological application or as a revolt against human rationality as such. There must be a new, broader, and more humane conception of knowledge and truth which will embrace the sensitivity of students for the present moment, their concern for moral values, and their commitment to the unity of thought and action.

Without denigrating or allowing the activist student to denigrate the human past and the accumulated wisdom of the race, there is a need for the university to devote more of its attention to the present and the future than it ever has before. Given the present mind-boggling rate of technological change with all of its social and cultural consequences, and given the staggering knowledge-explosion which is now upon us, the modern educator and the student have much to learn together and from each other. There are, in fact, many present realities of which professors are ignorant and with which the students are in immediate contact in their daily lives. Furthermore, because of the uncertain future into which they are sending their students, teachers must be concerned with equipping them with a functional learning that can adapt itself to new situations and problems. Teachers must help their students to think in a manner that will allow them to discover their own answers to questions rather than encouraging them to accept ready-made answers. One of the best ways to promote this is for the teacher to master the Socratic method of asking the right questions at the proper time and place in such a way that students are helped to express what they have already experienced but cannot quite bring to consciousness and articulate.

Thus, recognizing that education has formerly been too much oriented toward the past, the innovative teacher must be capable of achieving and propagating an openness of mind to new breakthroughs and a general readiness for originality and spontaneity--for example, in the creation and development of new methods and tools for research and analysis of elusive contemporary and future movements, events, and trends. Such an openness of mind requires not only moral courage but mental and physical stamina as well. For in studying present or future trends, the usual bibliographical sources are scanty at best and often non-existent. One is on one's own to scrounge around for materials, interview people, watch television, read newspapers, keep track of movies, listen to popular rock albums, and remain current with ephemeral pop-culture items which are seldom if ever bought or saved by libraries.

A Broader Understanding of the Student as a Psychosomatic Organism

Finally, innovative teaching will be expedited and much of the dessication of our universities and our culture can be overcome if the student is both thought of and treated in his totality as a psychosomatic organism who has a body, unconscious drives, aesthetic sensibilities, and moral sensitivity, as well as the capacity to think and talk. Any educational process which reduces nature, discovery, and learning to a dull affair--scentless, colorless, merely the hurrying-through of a certain body of endless, meaningless material--is lethal. It is as immoral to bore a student as it is to abuse him physically.

The lecture method, while still useful for limited purposes, must inevitably give way to a whole new battery of teaching techniques, ranging from role playing and playing games to interactive, computer-mediated classes and the immersion of students in "contrived experiences." Experiential programming methods, utilizing a multi-media approach and drawn from recreation, entertainment, and industry, will more and more be supplanting the familiar and usually brain-draining lecture. Educators have always known that learning and life itself are maximal where play and work coincide. The innovative teacher must try to create the kind of learning environment where this situation may either happen or be recovered. Then learning may once again become delightful, serious fun.

RATIONALE FOR BUILDING A TAXONOMY OF CLASSROOM LEARNING SKILLS

David A. Santoro*

There is increasing evidence today that educational practice has been weighed in the balance and found wanting. Some of the factors which have contributed to this judgment are: (1) the failure of educators and theorists to determine what are the lawful and relevant determinants to learning in a university setting, (2) the weaknesses of traditional psychodiagnostic methods in providing adequate assessment of relevant behavioral phenomena, (3) our earlier inability to provide a repertory of prescriptive interventions designed to effect a strategy for coping with learning problems, and (4) our failure to develop relevant criteria of effective human behavior and the means wherewith to assess our approximations to these criteria. In briefer terms, our teaching practice has been limited by an inadequate conception of What is school learning? How can we assess it? What can be done about promoting it? and How can we determine whether we have been successful or not?

The purposes of this paper are three-fold. The first is to discuss the development of educational practices within the context of the above central questions as they relate to the development of educational models. The second is to compare some specific approaches to educational practice within the context of these same questions, and the third is to provide an overall rationale for building a taxonomy of classroom learning skills.

Nearly all great philosophers, dictators, social reformers and exponents of revolutionary change have concurred in their conviction that the educational system of a people is a primary control mechanism for the development of specific skills and attitudes as well as behaviors on the part of children. As a result, education has been viewed as a primary mechanism for cultural transmission.

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The problem of What constitutes school learning has then been related directly to the pervasive and pivotal issues which confront society at any given time. The application of these philosophical or methodological ideas is strictly limited by the potential of teachers and administrators to initiate change in the fabric of society. Because philosophical and methodological ideas can be more easily expressed than implemented, the process is slow and sometimes halting.

What Constitutes Learning?

The question of what constitutes learning has been answered by three different models within the history of American education. Most of these models still remain in some modified vigor or form within the universities. These three models may be identified as: (1) the mental-discipline model, (2) the philosophy of experimentalism identified with John Dewey, and (3) the mental-hygiene approach basically derived from psychoanalytic and medical models of personality adjustment. To a large extent, these conflicting models of teaching and learning have variously conceived of the teacher as a content-oriented purveyor of knowledge (mental-discipline model), a guide for the progressive evolution of self-discovery experiences (experimentalism), or as a kind of junior psychotherapist (mental-hygiene approach). They have viewed the students, implicitly or explicitly, as terminal objects to be programmed with knowledge, as mechanisms for exploring the environment or as individuals whose mental and physical health are essentially jeopardized by the aversive environment of civilization.

Few of these approaches remain in pure form in the university system today. And yet teachers do believe in their role as a cognitive purveyor of knowledge (mental discipline), most believe that self-discovery and problem-solving are important social skills to be learned in education (experimentalism), and nearly all acknowledge that personal adjustment and stability are related to adequate learning (mental hygiene).

As each of these systems pervaded universities defining learning and the teaching process in differential ways, so the second question of How can we assess learning was answered differently by each of these approaches. Classical humanistic learning assessed learning primarily in terms of cognitive growth and development joined to verbal abilities. This can be readily seen in terms of the assessment devices used. Oral examinations, essay examinations, the ability to think on one's feet and defend ideas were all considered methods of evaluating the product of education. Theses, dissertations, term papers, and passing of extensive examinations also provide indices. But for the most part, these approaches were subjectively evaluated by the master teacher, the oral committee or colleagues.

In the philosophy of experimentalism, much more emphasis was placed on a process-orientation involving problem-solving skills primarily identified with social goals. However, since this can be less readily assessed than the methods used by classical humanistic approach, and because of the confluence of social philosophy with experimentalism in the thinking of Dewey and others, a need was felt for objective evaluation. This need was filled through group-testing procedures. Thus, group testing as an objective method of comparing individuals in relation to group norms was considered to be a more important method of evaluation characterized by the well-known biases of experimentalism in philosophy.

Within the mental-hygiene approach, the methods became once again more individualistic with the development of diagnosis, prognosis, and treatment procedures incorporated within the frame of reference of education. The teacher as a therapist was more concerned with providing a wholesome environment for the development of well-adjusted children, than in either of the other major approaches.

Certainly, the goals of the approaches and the processes used to evaluate educational change were then related to curriculum objectives. Curriculum objectives should focus on the answer to the question, "What can be done?" The approach of classical humanism was primarily one of systematic organization providing implicitly or explicitly the undergirding framework or scaffolding (as Ausubel in recent times has referred to it) for cognitive concept formation. Thus, knowledge could be divided into specific areas with sub-areas and specialities. These sub-areas could then be studied, memorized, learned in a variety of techniques. The approach of experimentalism focused on the teaching unit with social goals and democratic values providing much of the curriculum emphasis. Finally, the mental-hygiene approach was much less precise in terms of curriculum, drawing primarily from the other areas but specifying certain kinds of game such as socio-drama as curriculum vehicles.

Since each of these particular models did have a philosophical base for its approach which could be identified as: (1) classical realism, (2) experimental pragmatism, and (3) positivistic relativism, they did more or less efficiently prescribe the parameters of the learning process, the methods of attack, the goals for the process, and the curriculum vehicle to be used. In addition, however, they did attempt to formulate an effective criterion of the educational process. They sought to evaluate their efficiency against criteria such as the mental-disciplined humanist, the truly democratic man, or the well-adjusted personality. Since these ideas are only constructs, any attempt at the assessment of measured progress toward these goals was bound to suffer from a lack of specificity. Moreover, each of these ideological constructs was applied to the specific power structures of the school, and the interactive effect of all three models was applied differentially within the specific system.

It is apparent that education has been forced to cope with a variety of models of learning. Operationally or functionally, this has tended to mean that the teacher has been orientated in a curriculum program somehow designed to accomplish a job in the universities wherein the primary phenomena dealt with are variously interpreted, the methods used to cope with these phenomena subjectively related to the shifting phenomena, and the criteria of effectiveness for the most part not ascertained.

Although the existing educational models and practices have been effective in varying degrees, the real efficacy of the teacher has been hampered: (1) by a variety of conflicting models of education based on confused notions as to the primary phenomena of learning involved, as well as the goals, methods, and criteria of evaluation derived from several different disciplines and philosophical bases; (2) by inadequately conceptualized criteria for evaluating results of practice both within and between these several approaches; (3) by differential training programs which have attempted to meet, compromise with or otherwise synthesize disparate elements and foci into unified training objectives; and (4) by an inadequate philosophical base as well as a weak scientific methodology. In addition to these problems, the well-known recent emphases on disadvantaged children and the crash programs of the federal government (very often hastily implemented on the basis of suddenly available funding), inadequately conceptualized theoretical or evaluative bases, and limited personnel, have forced educators to operate generally as people who subjectively try to fit various tools and methods from their repertory to the tentative and expedient goals of the school in a pragmatic or eclectic manner.

Social Learning Model: Characteristics

If education is to provide a series of services to the university community in a comprehensive manner, it is imperative that somehow a logical model be developed. It is the assumption of the writer that at least a semi-scientific model can be developed utilizing the principles of logic and science to serve as guidelines.

The logical requirements of a comprehensive model for teacher training are five-fold: (1) the phenomena of the model should, in part, be empirically observable, definable and classifiable, (2) the interpretation of the phenomena should be non-eclectic, i.e., describable in terminology corresponding as accurately as possible to the simplistic empirical fact, (3) the ordering of the phenomena should be logically consistent and parsimonious yielding adequate discriminatory judgments, (4) the model should possess power functions for assessment and evaluation of differential phenomena within the model, and (5) the model should be philosophically sound and compatible with the scientific approach. These logical requirements will now be discussed in fuller detail as they apply to a social learning model of educational practice.

It is the contention of the writer that social learning theory provides, in part, a comprehensive, logical and scientific basis for educational practice. Specifically, social learning theory: (1) provides a comprehensive philosophically based and scientifically viable framework for describing, analyzing, and treating the phenomena involved, (2) is susceptible to scientific investigation, through the determination of adequate methods of assessment and evaluation of phenomena, together with a coherent testable set of treatment strategies, (3) provides the educator with a role consonant with the nature of the phenomena he works with, and (4) provides a rationale and methodology adequate for determining criteria of efficient operation, i.e., success or failure. In short, social learning theory provides a comprehensive, logical and integrated model of educational practice for describing, assessing, and treating basic learning phenomena.

Social learning theory can be considered as a body of scientific knowledge derived from studies of culture, the environmental press, skill acquisition, social psychology, and behavioral learning and psychotherapy.

The Empirical Phenomena of School Learning

One of the first tasks of any scientific endeavor is to define the basic phenomena which will serve as the separate focus for investigation. By way of consideration, one may look at either global constructs which have been used to refer to learning, or very specific concepts. Examples of the former are learning as an art wherein learning was considered a product of personality, ego development, motivation, mental discipline, or problem-solving. These global constructs represent humanistic constructs, intervening variables, or an array of complex skills. In short, they would appear to be the products of learning rather than the descriptive characteristics of learning itself. In the same way, the intensive animal studies of learning with identification of the stimulus-response model appear to be clear reductionism to an overly simplistic and atomistic term. Thus, one definition of the phenomena involved is apparently too global for precision in distinction and classification and the other approach is too minute. It is important that we should be able to determine the beauties of a sunset over the mountains and trees, and it is also important that we be able to zero in on the nature of a leaf in a particular tree. This may be called perspective. But in classroom learning if we are to deal readily with phenomena that can be manipulated and controlled, we must find an intermediate position which is sufficiently specific to allow for definition, but not so minute that it cannot be utilized meaningfully.

Such a construct can be found in the notion of skill. An empirical evaluation of the nature of classroom learning, plus the evaluation of a considerable amount of research literature in the specific areas of human learning and environmental "press", would appear to support the definition here that the skill concept defined as a functional ability to perform a specific task is the legitimate behavioral phenomenon of classroom learning.

Recent research and writing in education has suggested rather obliquely that the teaching-learning situation is moving toward the enhancement of task-oriented learning (Bower, 1964; Bordon, 1964; Bordon and Bennett, 1967). Moreover, the specific research of Gagne in the description of conditions of learning (1965), the cognitive emphasis of Ausubel (1965) and Bruner (1966), and the considerable research studies of the behavioral learning group found in Bijou and Baer (1961), Patterson (1967), Ferster (1962), Williams (1959), Lazarus (1965), Bandura and Walters (1963) and Hewett (1968) have provided the research background supportive of this definition of classroom learning phenomena.

Each of these researchers in their own way has helped to provide a research background which would support the notion of skill acquisition as the legitimate focus of the educational enterprise. For example, Gagne

(1970) has provided a sequential learning model which takes into consideration the step-by-step process of learning through signal and stimulus-response learning to chaining, verbal association and subsequent multiple discrimination and generalization. Taylor (1962) and Berlyne (1960) have identified the fact that different sensory modalities are involved in learning. Ausubel (1965) and Bruner (1966) have suggested that a different type of learning is necessary for cognitive association, concept formation and receptor learning. Ausubel particularly has emphasized the need for what he calls advanced organizers or the cognitive scaffolding which allows for the systematic expansion of verbal concepts. The behavior modification school, which has involved the experimental manipulation of children's behavior and specialized studies with hyperactive, autistic, tantrum-behavior and phobic children, though generally limited to experimental units outside the schools, has provided considerable research evidence regarding the efficacy of such techniques (Grossberg, 1964). Bandura and Walters (1963), though not again specifically addressing themselves to the classroom setting and drawing heavily on social psychology, have indicated the strength of such social learning techniques as imitation, vicarious experiencing, modeling, and shaping of behavior. Skinner (1968) has also suggested that teachers could obtain far greater results if they could define the kinds of behaviors they wish to obtain. Hewett (1968), in the application of much of this research and working in the specific context of educationally-handicapped children, has developed what he calls the engineered classroom in which the educational task-orientation learning system is broken down into seven stages or steps. These he conceives to be attention, response, order, exploration, social-skill acquisition, mastery, and achievement. He has found that children can be sequentially programmed through these stages, and that in point of fact it is extremely important that children learn the earlier stages before they proceed to the more advanced ones.

These research studies clearly point out that the concept of skill is a legitimate base for building a taxonomy of classroom learning.

The second area of research findings focuses on the question of learning contingencies. Given structural intactness, how can learning be augmented, corrected, controlled and enhanced? Research from the area of measurement of the environmental "press" provides another key to skill-acquisition rate. Measurement of the environmental "press" has stemmed from an effort to determine more adequate predictors and criteria of effective collegiate behavior. The concept developed from the research studies of Pace and Stern (1958), Thistlethwaite (1960), Holland (1959), and Astin (1965). This concept has related to the measurement of the means whereby the environment shapes and molds the behavior of the individuals who live within it. In a series of studies (Barclay, 1966) the writer has systematically explored the nature of environmental "press" in the secondary and elementary curriculum. The studies by the writer have provided evidence that peer ratings and teacher thrust constitute the two major criterion sources of effective human behavior in the classroom. These studies corroborate the research of others such as Backman and Secord (1962), Backman and Pierce (1963), and Patterson (1967).

Thus, it would appear that any attempt to assess social behavior in the classroom must take into consideration the cultural criteria of effective behavior which are set and sustained by the peer group and the teacher, sometimes in conjunction with each other and more often in some opposition to each other.

What all of this research leads to is a definition of classroom learning in terms of differential rate of skill acquisition within a social context. The following statements may summarize what appears to emerge as the fundamental framework for describing classroom learning. This framework takes into consideration both the fundamental set of behavioral responses issued by the subjects of learning (skill acquisition) and the methods whereby such responses are augmented, controlled and developed.

1. Learning may be characterized in the classroom as differential skill acquisition, subject to structural and environmental contingencies.
2. There is a hierarchy of skill acquisition extending from simple to complex manifestations.
3. Learning skills may be tentatively classified within the major categories of perceptual-motor skills, social skills, and cognitive concept-formation skills.
4. The rate of skill acquisition in the individual may be considered a dependent variable related functionally to structural endowment and environmental programming as independent variables.
5. Constructs such as attitudes, emotional states, affects and motivation are by-products of both interpersonal and environmental shaping and are related specifically to habits of skills acquired.
6. Classroom learning is task-oriented and systematically shaped by two major criterion sources (i.e., peers and teachers) who act as _de facto_ agents of the cultural transmission.

This approach to classroom learning then is characterized by the view of classroom learning phenomena as: (1) a series of task-oriented skills, (2) requiring differential programming in relationship to structural limitations and goal-setting of criteria, (3) shaped and influenced by immediate criterion sources of effective behavior identified as primary change of influence agents in the learning process, i.e., peers, teachers and curriculum materials.

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RECENT RESEARCH IN LEARNING BEHAVIOR: SOME IMPLICATIONS FOR COLLEGE TEACHING

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Research on Teaching

A recent review of research on college teaching has the intriguing title The Teaching-Learning Paradox. The paradox, as I understand it, is that on the one hand we are sure that teaching method, class size, and teaching style are important but on the other hand the research evidence fails to show that such things have much influence on how much students learn. Differences in teaching don't seem to produce differences in learning. For example, a major conclusion of the review is that the research on class size offers no clear support for the belief in the superiority of small classes.

To put this review in perspective, let me talk about a paper one might write called "The Rain Dance-Rain Paradox". The findings in the paper might be that variations in details of the dance, while passionately believed by the dancers to be crucial, would tend not to correlate with variations in rainfall. There would be some promising findings in the paper. For example, there would be consistent differences in rainfall in different areas and surely at least some of the differences should be attributable to differences in the rain dances. It might be embarrassing to discover that in areas of heaviest rainfall there seems to be the least raindancing but that could be explained by indicating that the features of the rain dance were well represented in the day to day behavior of the population. With such community support no special dancing is required.

The similarities between the rain dance-rain paradox and the teaching-learning paradox are perhaps superficial. As a professional teacher I certainly like to think they are; however some parallels cause nagging doubts. For example, just as there is the most rain dancing where there is the least rain, the most "teaching" occurs in special education classes and remedial classes which are also locales of minimal learning. And, as a graduate student, I often learned most when not interrupted by the graduate faculty.

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Of course, I'm not suggesting that learning is as uninfluenced by teaching as rain is by rain dancing. I am willing to argue that a lot of our teaching behavior is superstition, but what I am really asserting is that much of the research on teaching deals with aspects of teaching loosely related to crucial aspects of the learning process. Consequently, the value of the research is very much reduced and the results are very difficult to interpret.

The task of interpreting the research on teaching is similar to the task a chemist would have in reading a book reporting extensive research on some set of chemical reactions but which, inexplicably, neglected to mention an important variable, for example, temperature. The chemist could read the experiments, make some plausible guesses about what certain of the temperatures must have been, interpret data in light of those guesses, modify his guesses, and tease quite a bit of information out of the studies. The studies could be valuable without being well done or well reported; if interpreted carefully by someone who knew chemistry.

As someone who knows something about research methodology and about the learning process, let me offer some interpretations of research and college-level teaching.

My first point is relevant to the conclusion of The Teaching-Learning Paradox review by Dubin and Taveggia: the evidence fails to support the superiority of small classes over large classes. Assuming the validity of the conclusion, what does it mean? Exactly what it says and nothing more.

The evidence does not show that large classes are as good as small classes. The several research studies test three hypotheses: (1) The Null Hypothesis that there is no difference in effectiveness between large and small classes, (2) Alternate hypothesis A, that small classes are superior to large classes and (3) Alternate hypothesis B, that large classes are superior to small classes.

Some studies reject the null hypothesis and show small classes to be superior; other studies show large classes to be superior. The bulk of the studies fail to show differences.

The statistical techniques employed can show differences but they cannot prove equality. We cannot prove the null hypothesis. All we can do is say that our measurement procedure was not precise enough to detect any differences that might exist. The research does not prove the superiority of small classes; however, it would be a serious logical error to conclude that it shows large classes to be as good as small classes. We can restate and amplify the Dubin and Taveggia conclusion:

(1) Some small classes are superior to some large classes.

(2) Some large classes are superior to some small classes.

(3) Class size alone does not determine quality.

A second major point regarding the Dubin-Taveggia review is made by McKeachie in a review of research on college teaching published in 1971. "The Dubin and Taveggia review deals only with the effects of teaching on course examinations. The results presented in this (McKeachie's) paper substantially support their conclusion that so far as performance on course examinations is concerned, there is no strong basis for preferring one teaching method over another. When one asks, however, whether knowledge (1) is remembered after the final examination, (2) can be applied to new problems, or (3) is related to attitudes and motives, we find that class size and teaching method do make a difference. "Analysis of research suggests that the importance of size depends upon educational goals. In general, large classes are simply not as effective as small classes for retention, critical thinking, and attitude change."

McKeachie suggests that, in any course with multiple objectives, each objective should be stated and different methods be used at different times. He's not arguing for variety in methods merely for the sake of variety or to alleviate boredom. He's recommending careful matching of specific methods to specific objectives. But he does this at the end of the review, suggesting that it can be done in the future when we know more. Not everything is left for the future, however. McKeachie offers some very useful suggestions, supported by research, which we can use to begin or to further our efforts to match methods to objectives. I would heartily recommend the review to anyone who is serious about doing a competent job of college-level teaching. It will offer some ideas for improvements and help to confirm the wisdom of some of the attempts already made. And, perhaps you will find one or two of the studies intriguing enough to dig out and read in the original.

Research on Learning

Let me turn now to research on the learning process and examine implications it has for teaching. How much do we know about the learning process? It is fashionable for psychologists, when faced with such a question, to say something like this: "The scientific study of learning is really quite new. We have learned a lot, of course, but much of the work has been done studying rather simple kinds of learning. When it comes right down to it, we do not know very much that would be of practical use to teachers, particularly at the college level." I personally believe that any psychologist who makes such statements is speaking the truth. However there is a grammatical error in the last sentence. When the psychologist says "We do not know very much..." he is using first person plural where he should use first person singular. If a psychologist -- even an eminent researcher in the field of human learning -- says "I do not know very much..." then I feel it is good of him to confess his ignorance but I do not recognize his authority to speak for me. In all humility, I number myself among the hundreds of psychologists and educators who know quite a lot about the learning process that is of very practical utility.

In fact, I would assert that we know enough to revolutionize education if the knowledge were applied to the improvement of education. What, then, is that knowledge? And is it well-documented with solid empirical evidence or is it a collection of opinion statements that psychologists argue about among themselves?

These criteria were used in selecting the parts of research on learning to describe today: (1) The test of time - Each set of findings appeared first in the literature prior to 1929; (2) The test of continued investigation - Each set of findings has been replicated, further investigated, and supported by more recent research; (3) The test of relevance - Each set of findings can be related to specific instructional procedures; (4) The test of completeness - Taken together the findings can support a rather comprehensive set of guidelines for college-level teaching.

The first of six conclusions from the research literature states "As soon as learning stops, forgetting begins." One might ask "How soon is 'as soon as'?" and "What do you mean by forgetting?" By forgetting I mean falling off in the measure of learned performance, e.g. performance on a test. By "as soon as" I mean by the time the experimenter plots the first point on his retention curve. First points have been plotted within minutes, within hours, within days, within weeks, and within months after the mastery test. The generalization holds across the range of times (Woodworth and Schlossberg, 1956).

The second part of the conclusion regarding retention is that "If amount learned is defined as the difference between pre-test and post-test scores, the amount forgotten is approximately equal to the amount learned unless the material is reviewed during the post-test retention-test interval." In other words, the student rhetorical question "The more you study the more you know, the more you know the more you can forget, the more you can forget the more you do forget, the more you forget the less you know. So why study?" has some merit. One forgets most of what one learns. The amount forgotten is approximately equal to the amount learned.

But what is meant by "approximately equal"? In a variety of laboratory studies, using a variety of material learned, and a variety of retention measures it is uncommon for retention to remain as high as 50% for very long and quite common for it to drop below 20%. And, in all of the retention curves, the last point plotted is the lowest, indicating that retention is still dropping.

Most of the laboratory studies assume a zero as the pre-test score, which means that the data presented, if anything, over-estimate retention. Retention data on college-level courses is very rare and is ordinarily not collected in such a way that makes more than the wildest guesses possible about how much is retained. Even so, to estimate that students retain 50% of what they learn in a course for more than a few months requires more optimism (or possibly more ignorance) than I have been able to muster. Clearly, the burden of proof is on the professor who claims his students retain large portions of what they learn in his course.

The second of the six conclusions from research on learning is this:

Transfer of training (i.e. the ability to use what is learned later on or in a different setting) is a function of similarity between training conditions and transfer conditions. Large differences in setting, response requirements, and/or incentives result in little transfer.

There are several variants of transfer-of-training studies all revolving around the general question, "If training occurs under one set of conditions, does the learned performance transfer to other sets of conditions?" Early research made the answer very clear: Not much transfer occurs.

To substantiate the point that little transfer occurs all that's really necessary to do is point out -- as several researchers have -- that retention studies can be considered as special cases of transfer of training studies. Lack of retention is one instance of a failure of transfer of training. Many other instances could be cited. So clear were the findings that transfer does not just happen, and so clear were the findings that retention is minimal, that much of the research has dealt with what is essentially a teaching problem, i.e. how can one increase retention and transfer?

The answer to that question appears to be summarized by one simple guideline: Simulate transfer conditions during training and eliminate the time interval by timely teaching or by continued review or practice.

Please do not be misled by my use of the historical term "training". In this context the word "learning" could be substituted for the word "training".

The third conclusion from research on learning is that the learning skills of students are major determinants of how much is learned. There are wide variations in learning skills and abilities; however, students can acquire learning skills which enable them to perform well above their predicted abilities.

Students' learning skills are the skills they use in learning: How they study as well as how much they can get themselves to study or how much their teacher can coerce, con, or kindle the desire in them to study.

It is quite obvious that how one studies influences how much he learns. For example Gates (1917) did a very simple experiment in which some students learned material by repeated readings of material, whereas other groups spent 1/5, 2/5, 3/5, and 4/5 of the study time reciting the material. The result was clear: The more time spent in recitation the more they learned.

That the skills students use influence how much they learn is probably "intuitively obvious" to most teachers who have thought about it. It is not as obvious that students can be taught skills that enable them to learn more efficiently. Nor is it obvious that the acquisition of such skills can enable them to perform above their predicted abilities.

The conclusion that the learning skills used by students are major determinants of how much they learn rests on a solid foundation of research, but in adding the conclusion that students can acquire learning skills which enable them to perform above their predicted abilities, I am venturing into an area where people can reasonably question the adequacy of the evidence. Rohwer (1971) reviews some rather substantial supporting evidence. However, the evidence which convinced me was data collected in part to evaluate the effectiveness of reading improvement--learning skills classes at the University of Michigan. Smith and Wood (1959) report data showing that students completing the classes out-performed comparable students in terms of grade-point averages and ability to remain in school. Unpublished evaluation data (Brethower, 1970-71) for the years 1969-70 and 1970-71 also showed higher grade-point averages among students who completed the course. One group of students, designated as high-risk on the bases of SAT scores, had higher grades than would be predicted from their SAT scores. During 1970-71, in fact, the grade-point average distribution for the high-risk group was skewed slightly in the direction that would be predicted for a high-potential group.

The fourth conclusion from research is that a major determinant of what is learned (as opposed to how much) is the assessment procedure employed. Students instructed in what they are to learn and in how they are to be tested perform better than students not so instructed. Watson (1960) must be given credit for this conclusion. He pointed out that assessment procedures influence what students learn. The point is almost too obvious to be researched.

The fifth conclusion from research is that knowledge of results facilitates learning. As Bilodeau (1966) points out in a rather extensive review, knowledge of results has been shown to facilitate learning of an extremely wide variety of things from simple motor tasks to complex verbal knowledge. Not only does it facilitate learning but also it has been shown that learned performance tends to deteriorate in the absence of knowledge of results.

The sixth conclusion, that many concrete examples are necessary for concept formation, is a finding replicated in almost every concept-formation experiment ever performed (Razik, 1971). Attempts to teach concepts without examples are likely to end in failure, or in the subjects constructing the necessary examples, or in subjects who learn verbalizations about concepts but when confronted with examples demonstrate that they have not really learned the concepts.

To conclude that it is possible both examples and non-examples are essential for concept formation--and that is my conclusion--is to venture onto shaky ground. But the basic parts of the six stated conclusions are very well founded and are adequate to support the six guidelines for instructional design which follow.

The first guideline is quite straight forward. "Objectives should be clearly stated; students should be told in useful ways what they are to learn." This guideline follows directly from the fourth conclusion from research, namely that instructing students in what they are to learn improves their performance. The guideline also helps make it possible for students to adjust their study techniques in accordance with instructional objectives. For example, if students are told that they are to learn how to sort out key points from trivia and trivia from subordinate points they can direct their efforts in that direction rather than wasting effort memorizing trivia. Psyching out the prof, searching for the structure of the subject matter, and learning specific concepts are separable objectives which require different sets of study behaviors.

The first guideline says that objectives should be communicated to students; the second says "Testing-evaluation procedures should be used which assess attainment of the objectives." To quote Watson (1960) "If there is a discrepancy between the real objectives and the tests used to measure achievement, the latter becomes the main influence upon choice of subject matter and method." In other words, if your objectives speak in lofty terms about "understanding basic concepts" and "developing critical thinking" but you test ability to write down or recognize facts the students will learn to do the latter.

Your assessment or testing procedures must involve measuring the actual performance specified by the objectives. If they do not, then the assessment procedures must be validated in order to be meaningful. Otherwise the procedures will not only fail as measuring devices but they will also actually detract from your objectives. If the testing procedures are adequate, on the other hand, they will facilitate achievement of objectives.

The third guideline states "study procedures should be specified which encourage students to engage in study behaviors appropriate to the material taught." Since what students learn and how much they learn depend so much on their study techniques it follows that this should be an important area of concern to the instructor. I am operating under the assumption, of course, that one of the instructor's goals is to maximize attainment of course objectives for as large a percentage of students as possible.

The guideline is difficult to follow, primarily, it seems to me, because most instruction students have had encourages rote memorization. Not by design surely, but by failure to follow the first two guidelines regarding objectives and assessment procedures. It is difficult to get students to break out of a study style that has paid off for them in the past. But if the instructor has gone beyond rote memorization in his own grasp of the material, surely he could offer some assistance to students in this extremely important area.

The fourth guideline states that "different instructional methods should be used for different objectives". In general, the method of choice is one in which student participation is maximized and in which students engage in clearly specified approximations to the behavior specified by the objectives. This follows directly from conclusions regarding transfer of training, the importance of study procedures, and to a lesser extent the importance of knowledge of results.

The fifth guideline states "instructional materials should include many examples and non-examples of all the major concepts to be taught in the course." The reason for the guideline is simple: If it is not followed the concepts will not be learned, except by students who have already experienced the missing examples or who construct them or who find them in other materials or in other sections of the course.

The guideline calls for both examples and non-examples which is perfectly safe since examples of one concept can usually function as non-examples of related concepts.

The sixth guideline states "courses should be designed so that students can obtain frequent and immediate feedback on their attempts to learn. Feedback should be available while they are studying." This follows from the fact that feedback (knowledge of results) facilitates learning and the presumption that the proper function of studying is to learn.

The six conclusions are not the only well founded conclusions from the research on learning. Nor are the six guidelines for instruction the only clearly supported guidelines. But these are enough, I think, to provide both guidance and challenge to us in improving our courses. As our instruction comes closer to following the guidelines we will be able to see that it is better. If all our instruction followed all the guidelines, education would be revolutionized. And if our wisdom were great enough so that our instructional objectives were good, it would be a revolution for the better.

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PART TWO

STRATEGIES AND TACTICS IN PRACTICE

PART TWO

STRATEGIES AND TACTICS IN PRACTICE

It is one thing to speak in generalities about how teaching can or cannot be improved. It is another to begin to trade classroom experiences, to talk with other colleagues about how this or that instructional tactic did or did not work in practice. Both parts of the polylogue about teaching are valuable to be sure. Who, for example, would deny the importance of defining the parameters of instructional excellence? Such definitions establish our commonality as teachers, whatever our discipline. Still, from the individual faculty member's perspective, talking in specifics is often more useful. The more ideas we exchange, the more we become aware that we face the same problems, and can respond appropriately in similar ways. In fact, there exists an entire catalogue of valid techniques from which we may choose.

The fifteen papers in this section speak in specifics about curricular and course design and instructional techniques. Collectively, they go a considerable distance in establishing a useful catalogue of tactics and strategies. That so many discipline areas are represented here is an encouraging demonstration that the catalogue is open to all of us, regardless of the degree to which content dictates technique. More important, however, is the way in which each technique is presented. As one, the authors think in terms of system. That is to say, not that each is a "systems" man or woman necessarily, but that each has thought carefully about how content and pedagogy fit together into a coherent unit. The implication is that the catalogue of techniques is not an automatic do-it-yourself kit. It suggests possibilities only. As with a retail catalogue, one consciously chooses this or that item because it is an appropriate means to a particular predetermined end. The work of selecting appropriate instructional techniques is hard. It demands fully as much concentration, hard headed analysis and systematic trial and error as does scholarly research.

In presenting the articles in this section, the editors deemed it useful to group them into three sub-sections to highlight different aspects of pedagogy. To a certain extent, the groupings are arbitrary. That is, an article might reasonably have fit into either of the other two categories. The intent was not to set limits on the usefulness of any article but merely to suggest possibilities of analysis for the reader.

The first sub-section contains three pieces. Each focuses on revamping curricular design at the introductory levels of instruction; each represents a single stage of curricular development and of awareness of the consequent implications for pedagogy, especially in what are normally considered "skill" courses.

Professor Bruce Beatie, Chairman of the Department of Modern Languages, has written a prospectus on the future of language instruction. He wrestles with a hoary monster: having to teach foreign language skills to students who are beyond the age when learning another set of linguistic symbols comes naturally. Were he to construct a linguistic utopia, Beatie would have all children born to bilingual parents, skilled in both languages by age six, and formally trained in second and third languages from kindergarten through college. As a realist, he deals in short-run practicalities. He suggests that content be reparceled so that about 20 percent of it be oriented to the linguistic place and cultural setting of a language and 80 percent be devoted to skill acquisition. As Beatie breaks down each category into specific taxonomies of learning, he demonstrates that curricular revision requires systematic reconsideration of teaching techniques. Each part of the language curriculum, from the cognitive through the four basic performance skills, requires a coherent instructional design to facilitate student learning.

Professor William Chisholm, English, collaborated with the Chairman of the Department, Louis Milic, in rewriting the freshman English curriculum at Cleveland State. He also has supervised the implementation of the program since its inception two years ago. His article constitutes an important theoretical defense of the new curriculum, which in many ways constitutes an innovation more sweeping even than most "innovative" teachers undertake. That is, Chisholm and Milic have worked a revolution in content. They have founded their work on two premises about students and their language. On the one hand, they argue, students come to this or any university knowing "just about all they are ever going to know of the English language." On the other hand, they insist, students' knowledge about the language is abysmally limited, even perverse in its distortions. On this distinction between what students know of and what they know about English, Chisholm and Milic define a "strategy for learning". Students, Chisholm writes, are "led to make analytical statements about the form of the sentences they speak" and "to examine rationally and critically the opinions they have about their language." The achievable goal of this process is that students will develop a means to decide how sentences may be used to achieve clarity and wit.

To the extent that the revolution in content has already taken place the freshman English program is further advanced at Cleveland State than is the introductory foreign-language instruction. In another sense, however, Professor Beatie has gone beyond Chisholm and Milic in defining the consequences for teaching inherent in curriculum reorganization. Professor Chisholm's silence about teaching is the subject of a response by Professor Ferris Anthony, Education, to Professor Chisholm's paper.* The new English curriculum, Professor Anthony admits, successfully answers the questions "what may be taught?" and "what should be taught?". But he doubts whether it actually defines a strategy for learning from the students' perspective. The curriculum, he suggests, does not automatically define what students need to know to master content. Nor does it identify with any precision the teaching strategies which lead students to make certifiably rational statements, and to examine their opinions, about their language. In short, the implications of curricular revision for the teaching-learning transaction are broad. In his paper, at least, Professor Chisholm has not dealt with them.

By way of contrast, the third article in this sub-section, by Professor Richard Black of Mathematics, defines an operational model for the conscious union of curricular redesign and instructional technique. Step by step, Professor Black plots the evolution of an instructional system from what he calls the "one-room school" model which makes little provision for different rates and styles of learning to the "educational-park" system which caters to all such variations among students. Faced in 1968 with the need to structure an introductory course primarily for business administration students, Black and his colleagues, Professors Leonard Bruening and Joseph Egar, decided that the key to effectiveness in communicating the revised content to large numbers of students (many of whom were liberal arts majors) was to base instruction on perceived patterns of student learning behaviors. The result has been a fascinating interplay between the instructors' commitment to content and structure and their nearly complete willingness to adapt the system to the learning behaviors they observed. The lesson here is not that the structure Black, et al. have built is fit for all courses, but rather it is that systematic attention to the structure and results of teaching and learning is the essential guide to instructional effectiveness for more than the few exceptional students in any class.

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*Professor Chisholm delivered his paper to an I.T.G. Seminar on Teaching at Cleveland State University in April, 1972. Professor Anthony was a respondent on the program.

Directly following Professor Black's essay is a response to it made by Professor Frank Lozier, another of his colleagues in the Math Department. Lozier has taught the same sequence of courses in a more traditional manner. The questions he raises are important both because they get at real problems and because they serve to remind us that men with markedly different methodologies have strikingly similar concerns.

The next eight articles form a distinct unit in that they contain descriptions of specific instructional methods already in the classroom. Together, these articles define a modest central spectrum of identifiably effective approaches to teaching. With but one or two exceptions, every approach detailed in this chapter would fit somewhere along the spectrum.

The two lead articles (one by Professor Sam Lane and the other by Professor Kenneth Simpson, both of the Psychology Department, and his assistant, Mary Ruth Shaw) establish the effective outer points on the spectrum of teaching modes. The positions they take are neither extreme nor are they polar with respect to one another. Still, each emphasizes a different dimension of learning. Professor Lane stresses the cognitive domain; he is most comfortable applying aspects of more traditional learning theory. Professor Simpson and Ms. Shaw focus on the affective or social domain of learning. They seek to expand the scope of learning to include aspects of student's lives typically not regarded as central to education. It is not at all uncommon for the proponents of one emphasis to view the proponents of the other in the least favorable light, even to see them as "Prussians" or "charlatans" respectively. One of the more interesting lessons of this sub-section is that the cognitive and the affective can and ought to be viewed as complimentary rather than antithetical dimensions of learning.

Professor Lane explores a problem common to every instructor: how is it that you get the student, naive and/or unsophisticated in your content area, to a level of knowledgeability that you feel comfortable certifying? Lane argues, in part, that traditionally oriented teaching does not provide a satisfactory and reliable answer. A regimen of notetaking (on lectures and on readings) and bi- or tri-term testing reinforces student tendencies to develop information storage and retrieval skills exclusively. In addition it does little to motivate consistent intellectual effort and virtually ignores one of the essential components of the learning process--immediate feedback about the validity of a student response. Professor Lane argues that it is possible to develop a greater battery of cognitive skills, to overcome the motivational "problem" and to operationalize the feedback principle for maximum effect. His "Continuous Feedback Method" relies on a basic maxim of learning theory. That is, the effective teacher "shapes" learning through forcing the student to make a series of successively close approximations to the correct and sophisticated responses the teacher has defined as course objectives. The demands placed on both student and teacher are heavy. The former must prepare consistently so that he can respond appropriately at any time to the instructor's questions about the material under review. The teacher not only must be master of the content, he must develop an operable schema of approximations to content sophistication against which he can measure any student response to any question. There are few teaching skills that demand so active and intelligent an involvement by both student and instructor. But, with learning for each student as the objective, is there any more effective approach? Professor Lane is too modest to make any sweeping generalizations in response to that question. He has described a system, at any rate, which suggests that it would be difficult indeed to find more effective courses.

Professor Simpson and Ms. Shaw argue that the problem with education generally is that, in emphasizing the cognitive exclusively, it prepares the student's head for life but not his emotional or social being. In a society already advanced in its capacity to alienate its members, this is disastrous. What they want is to work "personal growth" courses into the curriculum as an integral component of the student's educational experience. Let him learn that life is composed at least equally of interactions with abstract things (one's task of the moment) and of interactions with other beings. Professor Simpson and Ms. Shaw build a systematic rationale for this approach based on the course in personal growth the former has designed. There can be no doubt that cognitive as well as experiential learning is as essential a goal as experiential learning. Honestly and directly, Professor Simpson and his associate face the thorny and fundamental issues of how learning in encounter-group courses is to be measured. Indeed, each component of the course, from the statement of instructional objectives to evaluate techniques, is meticulously designed and subjected to the controls of continuing research input and feedback. More, then, than many interpersonal relations courses, Professor Simpson's retains real and meaningful connections with traditional academic concerns.

Professor Howard Oleck describes an instructional method which has strong affinities to that suggested by Professor Lane. The "adversary method," an extension of the time-tested preference among law teachers for the case study, depends upon maximizing student response rates for its success. To learn, students must become actively involved in arranging content. Professor Oleck takes special care to structure assignments so that students learn to search for and deal with the core of the legal problems posed. Like learning theorists, he argues that "effective method" is a necessary ingredient for effective teaching, even for teachers who thrive on classroom dynamics. He asserts that the adversary method is effective, if properly designed, and that it can be adopted successfully in other disciplines as wide-ranging as history, literature and military science. The emphasis, clearly, is cognitive. The method works by fusing the case study, independent but structured student examination of issues and role-playing recitations into a coherent and monitored whole.

Closer also to Professor Lane's emphasis than to Professor Simpson's is Professor Marina Kurkov's description of the goals of a highly experimental approach to introductory language training.

She describes a method which certainly is unusual. It is doubtful whether many instructors can think immediately of a use for a technique which relies on creating conditions of relaxed awareness. The cynical among us might even object that student behavior in many classes already appears suspiciously consistent with such conditions. Learning does not seem enhanced thereby. However, Ms. Kurkov focuses on an important psychological problem: reducing anxiety and stimulating mental receptivity. She is appropriately circumspect in spelling out the theoretical basis for "Suggestology" and especially in defining rigorously the conditions under which the method is employed. For one thing, it is used for precisely defined purposes in a language skills course. It does not supplant other essential techniques such as recitation. And, though it may be novel in this country, it has had an extended history of elaboration in Bulgaria. The data Ms. Kurkov has culled in support of the superiority of the technique over more traditional methods are more encouraging than conclusive, but they command our attention. Perhaps the most relevant point here is that Ms. Kurkov does not confuse ends and means. She employs "suggestology" because she believes that it is a psychologically valid and effective way to accomplish the instructional objective which is cognitive mastery of specified content. In this respect, her article is appropriately placed near the end of the instructional spectrum taken by Professor Lane.

Firmly entrenched on Lane's side of the spectrum is Dean Jack Soules. Like Lane, Oleck and Kurkov, Soules is concerned with maximizing cognitive skill development. What distinguishes Dean Soules' article is its concentration on the practical. Explicitly disavowing any intent to deliver "a sermonette on good teaching", he addresses six minor instructional problems, the sort which perplex all of us at one time or another and which, taken together, can add up to an immense drag on instruction if left unresolved. Soules is a physicist, so one or two of his suggestions may not appear feasible outside the physical or natural sciences. Yet, if we substitute structured assignments for "laboratory experiments", all his instructional tactics can be adapted to most courses. In particular, the spirit which informs each technique is convertible currency. Soules challenges us to develop meaningful course objectives, to relate certification of student performance to those objectives, to provide experiences which stimulate skill development, to involve as many students as actively as possible in performance situations even in large classes, and to set up meaningful feedback and reward structures. Better yet, he demonstrates that each step is possible.

We move toward the center of our instructional spectrum with the next two papers, one by Professor Susan Gorsky and the other by Professor Alberta Turner, both of the English Department. Both instructors have rethought the traditional pedagogy in terms of enhancing the probability that students will be motivated by emphasizing that they have the capability of making meaningful, inductive statements about content. Far too many courses, they imply, are designed with the student consumer as only a peripheral consideration. If one adopts a student consumer orientation, as Gorsky and Turner do, the emphasis subtly shifts from a concern with teacher as authority to a concern with the creation of a learning experience which gets students to tap their own creative energies. How many courses never get off the ground either because too little attention is paid to insuring that students make initial involving and committing responses or, worse still, because we fail to recognize that many students believe that they cannot contribute anything of value in intellectual matters?

Professor Gorsky has wrought an intriguing rationale for the inductive approach to literary criticism. She has adopted a standard, rigorous critical methodology -- formalism -- to continuing classroom polylogue about the contemporary novel. The method is one in which "passive attention (or non-attention)" is replaced by direct involvement by students in their own learning experience. What Ms. Gorsky does not say is that the class or peer group forms an especially stimulating affective environment for the intensive, on-the-spot examination of difficult texts. Issues remain. For example, was the success of the course a function of its small size? Ms. Gorsky does not provide an answer here but she raises and honestly addresses other questions -- about coverage of material, about use of authorities, about the value of other critical perspectives. The impression overall is that she has designed a model course from which we can learn a great deal about the effective marriage of the cognitive and the affective.

Professor Turner's approach bases its premise more explicitly than Ms. Gorsky's on utilizing affective techniques. She begins by assuming that "the ability to write a poem is as universal as the ability to use any other form of verbal communication" and that "it can be taught -- in a classroom." Her secrets are revealed through three of her by-words -- "self-teaching", the "inductive" and "affective communication" or the use of verbal patterns "to surprise, disturb, and so energize" the writer. Writing poetry is an intensely personal skill. Therefore, Ms. Turner has constructed a series of free association exercises -- games, if you will -- which get students to discover the patterning of their inner thoughts. Like poets do. And, as a master of poetry and its formal study herself, she uses these exercises to illustrate such critical poetic usages as concreteness, rhythm, spacing, non-repetitive repetition, allusion, opposites, metaphor and ambiguity. The sources of poetry are emotional. Her course accepts this reality and turns it into instructional method. She suggests that, on a limited basis, pushing students to respond affectively to formal content in other disciplines may earn institutional dividends such as the establishment of relevancy, the overcoming of reticence when confronted by complex issues.

The last article in this sub-section is, in one respect, closer to the emphasis of Professor Simpson and Ms. Shaw than are any of the others. Professor Lance Buhl, History, has discarded traditional instructional methods in designing introductory American History courses. His article traces, step by step, the process by which he came to this decision and then, drawing on a number of instructional traditions, how he restructured his approach. The problem, as he perceived it, was that his courses typically had affected only a small minority of his students. Committed to the notion that the classroom formed the chief testing ground for the values of public higher education, Buhl sought a method that promised to ensure active learning by the great majority of students. Abandoned were the lecture mode (more central perhaps to history teaching than to any other discipline), the notion of teacher as sole authority, enforced student passivity and vagueness of goals. In their place, Buhl substituted peer-group discussions around specific tasks and case studies, the notion that students were the principal purveyors of historical meaning, structured and numerous student responses and very explicit behavioral objectives. The specific affinity between Buhl's approach and that of Simpson and Shaw is that the former sees in the successful small permanent peer group an intellectual home or security blanket within which students might venture some educated guesses about the meaning of historical situations at little personal risk of seeming "wrong". The more public test of the validity of these ideas remains the ability of students to resolve a historical problem in a way that is literate, logical and plausible.

The response of Professor Carl Semmelroth, Psychology, to Buhl's paper is a fitting way to close this part of the chapter. Semmelroth underscores two fundamental considerations. First, he argues that the key to instructional success, (i.e., stimulating student learning) is for the instructor, already the master of content, to set up an integrated series of "do-able" tasks. Through such tasks students can attain specified levels of content mastery. In this respect, Semmelroth concludes, Buhl's approach apparently has succeeded. Even more important, however, is the milieu in which effective teaching is attempted. Instructors who utilize the clear lessons of learning theory must be rewarded. Otherwise, Semmelroth suggests, effective instruction is likely to remain a sometime thing.

The last four articles in this chapter outline particular "technologies" of instructional analysis. Undoubtedly, one or more of the authors would deny strenuously that they are not at all concerned with gadgetry or machines -- that is true. "Technologies" is used here, not to imply mechanistics, but only to denote that the author(s) of each article has examined or presented a technique or procedure for carrying out an analytic operation in teaching. (This is a definition close to one used in Webster's New World Dictionary.) Each of the articles defines a highly informative model for one or another mode of analyzing the instructional process.

Professors Robert McNaughton and Richard McArdle, of Education, for example, give practical emphasis to all that we hear these days about behavioral objectives. The authors collaborated on developing a course, curriculum and methods, that would meet (a) a number of needs for students, (b) criticisms by faculty in the University and staff in secondary schools, and (c) goals defined by the instructors. Their project was ambitious. The means they chose met their expectations.

The specific merit of Profs. MacNaughton's and McArdle's article is that it demonstrates, through particular example, how a course can be systematically constructed from the statement of objectives to the elaboration of specific skill tasks for meeting each objective and, then, through evaluation of student performance and course components. For those of us in Arts and Sciences, it is tempting to dismiss the relevance of the approach adopted by MacNaughton and McArdle. After all, we might argue, theirs is a practicum as much as it is a content-oriented course. The examples upon which they elaborate, fortunately, are proof of the cognitive rigor they prescribe. The authors have gone far in dismantling myths about the supposed resistance of course substance to systematic translation as behavioral objectives. The translation does not destroy the integrity of content. It enhances the effective learning of substance.

Professor Phillip Emerson, Psychology, follows another instructional road, one that is becoming heavily emphasized in contemporary education -- computer-assisted instruction. But, unlike so many who find the computer a useful tool in teaching, Emerson avoids both massive machines and equally massive rhetoric about the wonders of the technology. On the contrary, he suggests that one can build a very flexible software system, using the relatively simple SNOBOL language, for use with smallish computers. With great precision, Emerson charts a strategy for employing the system in such a way that the basic principles of learning theory are carried out for each student. He concludes that the system he describes "trades a little intuition to gain much freedom for the course author to simulate the real-time decision process of a sensitive tutor." Those of us drawn to the instructional possibilities of the computer will appreciate the care with which Emerson progresses through his system.

Professor Ray Schultz, Business, starts with the point made in the criticism of higher education, that it is a "technologically nonprogressive industry". That is, innovations, capital accumulation (defined as the "congealed labor" of the professor) and economies of large scale are rare -- so, there are not significant increases in output per professorial hour of work. This all may sound a bit much to those who feel that teaching stands apart from mean market conditions. Implicitly, Schultz responds that such qualms are born of profound naivete about the mechanisms through which higher education is funded. Any examination of the rules in this State amply provides grounds for Schultz's approach. Explicitly, he works to demonstrate that it is possible to measure statistically what is effective and productive use of professorial time (or capital) in a course he has taught. Not by coincidence, a definition of that also serves as a definition of effective instruction, that is, teaching which maximizes student learning. Instead of describing an instructional system which depends on large enrollments and reduced student-teacher contacts, as sceptics of the approach might expect, Schultz argues that the teacher can be used in many more useful ways, one-to-one, even in large courses, by abandoning lecture and maximizing use of other instructional tools. In short, he demonstrates that the techniques of economic analysis do not rob teaching of its essential human quality. His is a fascinating piece.

The last article by Professor Ella McKee, Modern Languages, is a carefully documented evaluation of courses in Beginning German taught through programmed materials. The evaluation is excellent in a number of ways. For one thing, it was rigorously constructed so that biases would be minimized. For another, it was just as rigorously applied. Even students who dropped the course were polled. Significantly, Ms. McKee assumed that student input was a necessary condition of meaningful evaluation of instructional method, in order to increase the range and number of data. Perhaps more important, Ms. McKee was prepared to ask the hard questions, to face the least supportive data honestly and to derive from the data appropriately circumspect conclusions and recommendations. In other words, Ms. McKee has constructed an exemplary model of the way in which the conscientious teacher subjects her work to close, systematic scrutiny for improvement. Each class -- each student -- deserves no less.

THE STRUCTURING OF INTRODUCTORY LANGUAGE PROGRAMS: A THEORY AND A PROPOSAL

Bruce A. Beatie*

It is an axiomatic assumption of this paper that language learning at the college level is influenced by a set of conditions radically different from those under which most college-level learning and teaching takes place. The theoretical aspect of this paper is an attempt to define as accurately as possible the parameters and conditions, under which college-level language learning takes place; the proposal is for a structuring of the language-learning (and, of course, teaching!) situation which will, within those defined conditions and limitations, lead to the best possible learning at the least possible cost. The proposal attempts to ignore insofar as possible both "the way things always have been done," and the nature of available learning materials. These are, in fact, relevant parameters as well, but they seem to me less inevitable than those described at length below.

Definition of Parameters

The limiting conditions affecting language learning and language teaching at the college level seem to fit into five categories: attitudes, curricular situation, the phenomenology of language learning, the administrative and fiscal structure of the university, and "goals" (both personal and pedagogical at a variety of levels). In practice, these categories interact constantly; for descriptive purposes, however, it is necessary to isolate and discuss each category in turn.

General American Attitudes

This sub-category is synthesized most succinctly by Henry Higgins' plaint at the beginning of My Fair Lady: "Why can't the English teach their children how to speak?" The English-speaking peoples have traditionally, at least since the sixteenth century, paid less attention to language as a phenomenon, to their own language, and to other peoples' language than has any other linguistic group within the Western world. Whether this is due to geographic insularity, to politico-economic dominance, or to some combination of reasons is anyone's guess. The fact is nonetheless obvious, and the United States has not only inherited, but indeed intensified the "Anglo-Saxon attitudes" of the mother country. This linguistic xenophobia, paralleled in history only by that of the ancient Greeks (whose word "barbarian" means basically "people whose language sounds like a dog's barking -- 'bar-bar'"), became virtually an American policy of acculturation as part of the "melting pot" concept dominant since the last half of the last century.

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Changes in American Attitudes

At this point, in the middle of the twentieth century, it seems as if those attitudes are undergoing some fundamental changes. On a national level, the changes are doubtless related to the increasing internationality of world society, and the increasing international involvement of American business; low student air fares to Europe, and the EURAILPASS are carrying this change down to the level of young people. On a local level, the ethnic movement and the trend toward small-group identification within a pluralistic society. On the individual level, especially among the younger people, the change is associated with "Consciousness III", with a new openness toward polycultural influences; A parallel can be made, and should be exploited, between mind-expanding drugs and mind-expanding languages. These changes, however, are happening with all the slowness of all major cultural changes, and have not gone far enough at this point to be considered a ruling parameter. They are, however, relevant to the question of goals.

Specific Student Attitudes

The attitudes toward foreign languages on the part of the average college student are, of course, a reflection of the general national attitudes, but they are affected as well by aspects of curricular structure, and have effects in their turn upon the phenomenology of language-learning.

Curricular Situation

The fact itself that extensive introductory language programs exist at all at the college level is a function of attitudes, and not of pedagogical realities. In the admittedly "elitist" American curricular structure prevalent in the nineteenth century (an imitation of European, especially German models), most introductory language-learning took place at the elementary and high school levels. At the college level, languages were taught primarily as philology, as subject matter rather than performance skills.

With the populist revolution, however, attitudes began to affect the priorities that determined curricular structure. Language study began to be considered a luxury rather than a necessity, and the "buck" was passed from the elementary schools to the high schools, and from there to the colleges (college language requirements *per se* did not begin to be articulated formally until the late 1920's) The *reductio ad absurdum* of this whole historical process is the existence of foreign language requirements at the Ph.D level -- the requirement of what amounts to elementary-level learning at a time when the student is ready for, and involved in, advanced specialized study.

The historical change which began around 1900 seems to be continuing. The changes in American attitudes described above may shift its direction, or may even reverse it, but we must for the moment live with its consequences. Where introductory language-learning *should* be in the total curriculum is a function of the phenomenology of language-learning, and will be discussed below.

The Phenomenology of Language-Learning

The principal parameter here is the primacy of the spoken language. A child learns his mother tongue inductively, and very rapidly, in a process of habituation not essentially different from all the other habit-patterns a child develops in order to "deal with," function in, and interact with the world around him. Language-learning differs from other forms of habituation-learning primarily in the degree of symbolism or symbolization involved. The written language is essentially a metalanguage, or language-about-language imposed on the primary spoken language. It can try to impose logic on the spoken language (traditional Latin-based grammars), or it may try simply to describe or represent the spoken language.

Neither the spoken nor the written language can be considered primarily as a tool (as are the languages of mathematics, professional jargons, or computer languages). Benjamin Lee Whorf goes so far as to suggest that language is perhaps the determinant of all thought and perception, and hence prior to thought. Though his extreme view has been criticized, it is by now an accepted linguistic axiom that language (and by that I mean "the mother tongue") is at least one of the principal determinants of thought-patterns and modes of perception.

The ease with which a child learns these crucial habit-patterns is one of our crucial parameters. There seem to be four basic abilities involved: aural orientation, imitative ability, inductive ability (the ability to use analogy), and openness to the new. All of these abilities, for the average individual, decrease with age. The decrease is probably not a function of aging itself, but of patterning in the learning process; the more an individual perceives order in the phenomenal world, the more his behavior is determined by learned patterns rather that by real phenomena.

Learning a Second or Foreign Language

For a pre-school child, the learning of a second language is nearly as easy as the learning of his mother tongue, under the right circumstances. Research in bilingual families and bilingual cultures shows that the bilingual child begins to speak both languages as soon as does the monolingual child does his mother tongue. He is significantly slower than the monolingual child in developing reading ability, but then catches up rapidly. By age 6-8, the bilingual child is usually as competent in both languages as the monolingual child is in one, with no apparent loss in other areas of learning. Indeed, the bilingual child will tend to learn in later education both faster and more easily than the monolingual child.

The right circumstances, however, are essential. The child must have not only bilingual parents, but a bilingual peer-group. The latter is the more important. If it is lacking, the child may learn passive skills in a second language, but will often refuse categorically to learn, or at least to practice, the active skills. This is, in a different way, a problem of attitudes again.

The college student, on the other hand, has spent 12 years unlearning precisely those abilities which make language-learning easy, and has often developed an attitudinal set which may, in some few cases, literally cause a so-called "mental block" against the learning of a second language. The problem is complicated by the fact that, on the one hand, the four basic language-learning abilities are not lost in lock-step (some students, for example, may maintain a high degree of aural orientation at the same time that they lose imitative ability to an unusual degree); on the other hand, the development of other sorts of abilities happens differently for different individuals. These facts have two important consequences as far as college-level language-learning is concerned: (a) The rate of effective language-learning varies so widely from individual to individual that the normal five-quarter (or six-quarter, or four-semester) learning sequence is a compromise that literally fits almost no student. Some can learn in two or three quarters what others may take eight to ten quarters to learn: (b) Students have widely differing learning abilities with respect to the so-called "four skills" of reading, listening, writing and speaking . Some can learn to speak very easily, but have great difficulty learning to write grammatically. Others can learn to read easily, but may have great difficulty in understanding the spoken language. This means that, in addition to the general problems of second-language learning, there are specific problems associated with each of the four skills. However, since these will have to be mentioned again when discussing specific aspects of my proposal, I shall postpone these highly specialized parameters to that point.

Administrative and Fiscal Structure of the University

Since these differ from institution to institution, and since many of the parameters in this area arouse various sorts of emotional reactions, I shall simply list them in outline form:

1. Organizational parameters-
    - (a) Types of classroom space available,
    - (b) Other facilities available (language laboratory, etc.),
    - (c) Time-structure (block-scheduling system, etc.),
    - (d) Term-structure (quarter system, etc.).
2. Curricular parameters-
    - (a) Prerequisites (in terms both of entrance requirements and of course-to-course progression),
    - (b) Balance (major requirements, area requirements, desire for electives),
    - (c) Credits (how to balance lab credits against lecture credits, performance-skill credits against subject-matter credits),

(d) Goals (see below).

3. Fiscal parameters-

(a) Introductory language courses generally have the lowest level of support within the budgetary structure, which means that

(b) Introductory language courses generally must enroll somewhere around 30 students in order that the departmental budget may break even; but

(c) Any introductory language class of the usual type (balanced four-skills approach) loses about 4% to 5% in effectiveness for every enrollee over 20; in other words, a class of 30 students is about 50% less effective than one with 20 students.

Whether defined or undefined, explicit or implicit, "goals" exist within the university at a variety of levels, and they often seem, if not mutually contradictory, then at least less than coherently interdigitated.

Goals of Language Teachers

Our department went through the exercise, nearly a year ago, of attempting to reach a consensus as to our own internal pedagogical goals, and the results of these deliberations are available in our essay "On Languages, Language-Learning, and the Language Requirement." Briefly summarized, they are as follows: development of performance skills in a second language to the point where the forgetting-curve is approximately equal to that obtaining in other college-level courses; an integration of skills-learning with changes in attitudes, and with knowledge about the phenomenon of language itself and the culture carried by the foreign language learned; and in an ideal academic universe, this should be fully integrated with other parts of the "liberal education" curriculum -- this last, however, being a goal which we alone can implement, only to a limited degree.

Goals of Other Disciplines, of the College, and the University

This is an area within which even angels, to say nothing of the individual faculty member, fear to tread. At the Cleveland State University and elsewhere, curriculum committees are presently discussing either this problem itself, or else structural problems which depend implicitly upon goal-definitions. It is sad to observe how frequently structural changes are made, often of a radical nature, without prior consideration of the different systems of educational goals affected. This might be an area where the methodology of systems analysis could be applied with profit.

Goals of the Individual Student

At the Cleveland State University, the average student seems to have principally use-directed goals. He sees his degree as a "union card", and his usual question with respect to any piece of the curriculum is: "What can I do with it?" This view seems often in direct conflict with the traditional goals of the "liberal education", at least as I perceive them.

A Proposal for Restructuring Introductory Language Programs

In attempting to translate the parameters described above into a program which is both efficient and effective, I need to restate in somewhat more detail the specific goals on an introductory language program. They fall into two categories which differ in approach.

In terms of performance skills, which amounts to perhaps 80% of the total time spent in introductory language programs: the program should develop minimal internalized proficiency in reading, understanding, speaking and writing a language beyond the student's mother tongue. (These four aspects, the traditional "four skills", represent a behavioral sub-division. A more descriptive categorization might define the performance goals as: "minimal internalized command of the phonetics, the grammar, the lexicon, compositional skill and conversational skill in the foreign language." This sub-division, however, tends to confuse real performance skills with subject-matters and with analytical categories.)

In terms of subject-matter, the program should develop the student's awareness of traditional attitudes, his knowledge of language as a phenomenon and of the interrelationships of existing languages, and thereby develop an informed self-critical attitude toward his native language. Furthermore, the program should impart both knowledge and, where possible, direct experience of the culture (literature, customs, history, etc.) carried by the foreign language being learned.

I shall discuss the implementation of these goals first in terms of learning modes, and then in terms of organizational structure. The separation is, of course, artificial.

Learning Modes

The subject-matter goals can most efficiently, and perhaps even most effectively, be implemented through a combination of large lecture and small-group discussion. In most current introductory language programs, these goals are met through random, off-hand excurses by instructors. The best learning mode would involve four steps: (1) coherent organization of the material (a syllabus), and (2) extensive readings, underlined by (3) large-scale lectures, further reinforced by (4) small-group discussions. The question is where does this material belong within the program? That which now comes to the student through random comments can, of course, be pulled out of the language-skill sessions and organized into a single-term course. Such a course could be placed at the beginning of an introductory language program, but may not be fully effective there for two reasons: the general linguistic material needs concrete examples from more than one language in order to be internalized, while the target-language material cannot be taught effectively until students have some basic knowledge of the target language itself. It could be placed at the end of an introductory language sequence. but one loses thereby the crucial perspective on the whole skills-learning process which this subject-matter provides. The best mode is, therefore, probably to present the subject-matter throughout the skill-learning sequence, on the basis of weekly or bi-weekly lectures. The general linguistic material should be presented roughly in parallel to the first three quarters (first year) of the skills-sequence, and the target-language material parallel to the last two quarters.

This learning mode has several advantages over what happens currently in introductory language classes: (1) There is a core of systematically-presented subject-matter running throughout the performance-skill-learning sequence, making possible (2) a basic syllabus for all first-year language courses, and separate target-language syllabi for all sections of a single second-year language; (3) performance-skill classes can both use constantly the knowledge and insights derived from concurrent lectures, and can serve as the small-group discussion section for the lecture materials; (4) the best possible use is made of those faculty members who are charismatic lecturers; (5) the approach is adaptable to possible videotaping; and (6) it is highly efficient, both in use of faculty and in scheduling, since the general linguistic lectures can be offered at one time to all first-year students, irrespective of language, and the target-culture lectures at one time to students in all sections of a given language.

The performance skills cannot properly be isolated from one another. Not only are they mutually interactive in practice, but our surveys of student interest in various aspects of language-learning suggests that most students wish to learn all four skills simultaneously. However, not only do the four skills differ in terms of effective learning modes, but also, and very widely, in terms of rates of learning. An effective program, therefore, must attempt a partial isolation.

Reading Skills

These skills are the easiest to learn, and for most students can be learned rapidly. If texts are carefully graded, and are associated with much visual material, reading can be begun with a minimal grasp of grammar. A totally programmed reading course is not only feasible, but already exists for several languages. Especially at the beginning levels, development of reading skill scarcely requires contact with an instructor. It does require, however, a reasonable high degree of self-discipline and motivation on the student's part. As skill develops, interest in discussion of the readings develops, and that requires an instructor. Discussion itself, however, is not directly related to development of reading skill.

We should, therefore, set up for each language a program of reading-skill goals outside of any classroom situation. A given level of proficiency can be defined, for example, as "-- pages of a given level of difficulty, read within -- minutes and with demonstrated comprehension." It should be remembered that reading is a skill which can be tested objectively, using machine-gradable tests.

The advantages of this mode are that: (1) it makes maximum use of the self-testing potential, and (2) offers the student virtually unlimited self-pacing, as well as, at somewhat more advanced levels, (3) considerable individualization in terms of materials read; (4) it makes little use of expensive faculty time. Its principal problem is that relatively few appropriate learning materials, especially for the beginning levels, are available.

Listening Skills

Understanding the spoken language is, like reading, a set of passive skills, and hence is also adaptable to a programmed approach; the effectiveness of a programmed approach to listening skills, however, drops off much sooner than that of one for reading. Nonetheless, a listening program can be developed, parallel to that for reading, where a given level of proficiency can be defined as "having listened to -- hours of material of a given level of difficulty, with demonstrated comprehension." Listening skill, too, can be tested objectively, using machine-gradable tests.

The advantages and problems are the same as those defined for the reading skills. Here we encounter, however, the additional problem that there is a radical difference between the experience of foreign-language spoken materials in a listening-booth through earphones, and the live experience of either simply listening to a person speak (lecture), or listening to a conversation. In the live situation, body language, gesture, expression, dialect, intonation, ellipsis, broken sentences, simultaneously increase and decrease the problems of understanding the spoken language.

This transference problem, however, is in a sense automatically taken care of by the fact that, while listening can be learned on a self-study basis without really learning another skill (as can reading), the speaking skills cannot be learned without simultaneous development of listening skills. Hence the approaches described below (under "Speaking Skills") provide to some extend the "living-experience" component of the listening skills.

Writing Skills

Writing, in contrast to reading and listening, involves a set of active skills, and has two basic prerequisites: a minimal grasp of grammatical structures, and command of a minimal lexicon. Development of writing skills requires extensive writing practice, with constant corrective feedback. It is therefore much more difficult to develop a self-paced programmed approach to writing. Both grammar itself (as a body of knowledge, not as a generative skill) and a lexicon can be learned through programmed materials both can also be learned inductively through development of reading and listening skills. But since writing is a generative skill, generating not only an infinity of possible sentences, but a mega-infinity of possible paragraphs and longer communications, there is no way of setting up a self-testing procedure much beyond the beginning level. (Not even direct translation against given models works here, for obvious reasons -- and the act of translation is in any cast a violation of some basic principles of language learning.)

Hence an instructor is a necessity within a writing program, mainly functioning as corrector and guide in writing practice. The level of proficiency which such an instructor must possess, however, is much lower than that necessary, for example, to teach speaking skills. The writing done by students at the first- or second-quarter levels, for example, can easily be corrected by students (good students, at least) who are on the fourth- or fifth-quarter levels (for whom it amounts to useful reading practice; the writing done toward the end of the introductory language sequence can easily be corrected by upper-level language majors (for whom it's not only reading practice, but an introduction to language pedagogy as well). The most effective mode of learning writing skills is therefore a tutorial situation, supplemented by constant correction of writing practice (for which student-corrector contact is not necessary).

Speaking Skills

These are the slowest of skills to develop, because they are active, generative performance skills bound by time. Response must be made instantly. There is not time for reflection and consideration that is available in writing, the other active set of skills. Furthermore, modes of analytical-deductive learning are almost totally irrelevant here. Like the writing skills, speaking can be developed only through practice, but here the practice is much more clearly a process of habituation, the development of stimulus-response habit patterns that can function without conscious reflection.

Furthermore, while the listening skills, as was mentioned before, can be developed in relative isolation from the other skills, the speaking skills cannot be developed without simultaneous development at least of the listening skills. Speaking proficiency is doubtless helped by increasing proficiency in reading and writing, but these skills are not absolutely necessary to speaking, as the Berlitz method shows. Laboratory practice tapes are helpful, especially in developing listening skills, and can give essential practice in generating isolated sentences as well as very limited practice in stimulus-response patterns.

However, no practice in free speaking is possible without the conversational classroom situation. Hence this is the only one of the four skills where the classroom teacher in the accepted sense is truly essential. The term "classroom situation" includes, in this context, two different modes: (a) tutorial: conversational practice carried on in a completely free person-to-person way, without any obvious structuring (though, of course, some structuring is implicit in the study materials, and the tutor must mentally pre-structure what he wishes to accomplish in a given session). The upper limit of group size in this mode is 4-6 students. (b) class: once a group goes beyond 4-6 students, real "free" conversation becomes impossible, and a much more overtly-structured learning situation is essential. Choral repetition and pattern practice supplement here a limited amount of free conversational practice. In the "class" situation, group dynamics suggest a lower limit of effectiveness may be around 10 students; the upper limit is clearly 18-20 students. (It should be remembered, as noted earlier that learning effectiveness in a conversationally-oriented foreign language class drops about 5% for each student enrolled above the limit of 20.)

Class practice in developing speaking skills can be handled effectively only by a trained teacher with a high degree of fluency. Tutorial groups can probably be handled by good language students whose level of proficiency is about three to five quarters ahead of the students they are tutoring. That is, fourth-quarter students can probably tutor first-quarter students, advanced majors can tutor fourth- or fifth-quarter students, and so on.

It should be remembered that, thus far, no objective methods of testing conversational skills have been developed.

Organizational Structure

The principal problems in this area are: scheduling, progression, and evaluation (all of which can be loosely classified as "sequencing" problems), and "completion" (definition of the stage or level at which internalization of the foreign language has reached the point where the forgetting curve will be roughly equivalent to that of other college-level courses. The only area of the four skills where sequence is essential is in developing speaking skills: beginning students cannot function conversationally in classes or tutorial groups with students whose proficiency is substantially higher. In any conversationally-oriented group or class, relative homogeneity is essential Nearly the same thing is true of listening skills, insofar as the classroom situation is concerned.

Conversation-oriented sequences must therefore be tied to achieved proficiency, not to attendance; in them, letter-grading is inappropriate for a variety of reasons, and Pass/Fail a viable alternative.

Out-of-class reading, listening and writing programs can be internally sequenced, with the syllabus-determined sequence of self-study materials and the progressive tests determining the progression.

Subject-matter learning is sequenced not by developing proficiency, but by the inherent logic of the body of knowledge to be learned. This area is as adaptable to ordinary testing methods (including objective, machine-gradable tests) and the letter-grading system as is any body of subject-matter taught at the university.

"Completion" means, as noted, achieving a level of performance-skill proficiency that has been internalized to the point where the forgetting-curve approximates that of other college-level courses. It also implies completion of the subject-matter sequence. Subject-matter completion is easy to document, but for the performance-skills it is necessary to set up a complex set of interrelated tests and evaluations, so that, for example, someone who develops a very high level of reading skill may use that to balance a low level of speaking ability.

I propose therefore that an arbitrary ten levels of proficiency in each of the four performance-skill areas, such that the tenth level in each case means full ability to handle that skill in a course on any subject-matter taught in the language being learned. Tenth-level proficiency in all four skill-areas would assure the ability to attend a university in the country of the target language. This means that level ten is substantially higher in each separate skill-area than the performance achieved by most students at the end of the usual introductory language sequence.

The student would then earn one point (one credit) for each level of skill achieved in each skill-area. "Completion" would mean accumulation of 20 points in any combination of skills: for example, tenth-level skill in both reading and listening, or fifth-level skill in all four skills, or *any* combination that adds up to 20.

On the basis of the assumptions stated above, I propose that the introductory language program be organized as follows. Each heading represents one or more listings in the college catalog and schedule of courses.

(1) *General Linguistics*. For beginning students and others interested. 2 credits; no prerequisites. 20 class-sessions of lectures, plus readings and tests. Lectures biweekly, except for the first week of the quarter; the sessions scheduled over three quarters, beginning a new sequence each Fall and Winter quarter. Same lectures for students in all languages.

Maximum lecture-section size: 150-200. The subject-matter should be interdigitated as far as possible with that of the basic English composition course, and should refer ahead to other Linguistics courses offered at the university.

(2) Target Language and its Culture. For students with some experience in the target language. 3 credits; prerequisite is a combined proficiency-level score of about 10. 25 class-sessions of lectures, with readings and tests. Lectures weekly except for the first week of the quarter; the sessions scheduled over two quarters, beginning a new sequence each Fall and Winter quarter. Separate sections for students in each target language. Maximum lecture-section size: 100.

(3) Reading Clinic. Discussion and problem-solving sessions scheduled weekly, available to students on an open basis some 24 hours each week; a faculty member responsible for supervision and some 12 hours of attendance, the remainder to be handled by advanced majors and graduate students. Student register for 1 credit each quarter that they wish to use the services of the clinic. Additional credit will be granted in a given quarter if the student advances more than a single proficiency-level in reading. Registration allows the student to take tests and have them corrected and scored, as well as to take advantage of discussion-sessions and tutorial help.

(4) Writing Clinic. Its structure is identical to that of the Reading Clinic.

(5) Listening and Oral Practice Program. Sequences of listening and pattern-practice materials to be available in the Language Laboratory, open some 55 hours weekly; lab attendants will whenever possible be language majors who can assist students working in the lab. Students register for one credit each quarter that they need to use the Laboratory; registration entitles them also to take listening-proficiency tests, have them corrected and scored.

Credit will be granted on the same basis as in the Reading and Writing Clinics.

(6) Conversation Classes. These will be graded classes roughly parallel to those in the usual introductory language sequence. These conversational classes will use a standard introductory text, but no writing or reading practice will take class time; students needing work in these areas will be directed to the appropriate clinic. Students will register for 2 credits at each class-level. They may be granted anywhere from 1-4 credits depending upon their advance in proficiency. There will be three to five contact hours weekly: three sessions in classes taught by regular faculty members, with an upper limit of 20 students. One or two additional sessions will be in tutorial groups with no more than five students, taught by advanced undergraduates or graduate students. Progression from class to class in the sequence will be determined by the combined proficiency-level score a student has achieved by the end of a quarter.

For example:

Spanish I. No prerequisites. A student will normally achieve speaking-proficiency levels 1, 2, or 3.

Spanish II. Prerequisite: a combined level-score of 6 (for example, 2 from Spanish I, 2 from the Listening Program, and 1 each from the Reading and Writing Clinics). A student will normally achieve speaking-proficiency levels 3, 4, or 5; his total proficiency-score at the end should approach 10.

Spanish III. Prerequisite: a combined level-score of 12. Achievement: speaking-proficiency levels 5, 6, or 7; his total should approach 18. (In other words, at this point a student should be near "completion" as defined above.)

Spanish IV. Prerequisite: a combined level-score of 18. Achievement: speaking-proficiency levels 7, 8, or 9; total should approach 26.

Spanish V. Prerequisite: combined level-score of 24. Achievement:

speaking proficiency levels 9 or 10; total should approach 34. It should be remembered that the crucial element in the organizational structure proposed here is the isolation of subject-matters and the various skills and the development of learning modes separately appropriate to each which aim at maximizing both learning and efficiency. I hold no brief for details of the structure proposed; many variations upon the basic pattern are possible, and I am sure that some possible variations would be an improvement over the ones suggested here.

Conclusions

The introductory language program which I have proposed offers a number of concrete advantages over the programs usually offered at the college level. From the student's point of view, it means that the behavioral objectives of the various aspects of the language program are clearly distinguished from one another, so that the student may choose to emphasize those objectives which interest him. The relative isolation of skills also makes it easier to identify a student's special problems, so that, if he is getting into difficulty, feedback will come before the problem becomes dangerous. Both the high degree of individualization and the relative lack of grade-pressure in the performance-skill programs will eliminate many of the psychological hindrances to language learning which are apparent in many current introductory language programs; and finally, because of its clear articulation of the subject-matter component in relation to performance skills, it should lead to a significant change of attitude toward languages and language learning. From the department's point of view, it assures that our goals will be met; especially important, it assures that whatever proficiency in language skills is achieved will be real, internalized proficiency; and it allows much more freedom and flexibility to the individual faculty member. From the university's point of view, the proposed program is much less expensive than the usual introductory language program, because it makes most effective use and efficient use of both human and technical resources available.

The proposal doubtless conceals many problems, some of which I am aware of. For example, the transition from a standard program to one such as is proposed here will surely be an administrative nightmare; I am convinced, however, that the operation of such a program will be no more difficult than that of a more usual sort of program. Secondly, the proposed program is designed with heavily-enrolled languages in mind; it may be difficult or even impossible to implement for languages where, for example, initial enrollment in a learning-sequence is 30 or less. Finally, there may well be special needs arising for special courses (for instance, an intensive reading course may be necessary as a supplement to the Reading Clinic). The flexibility and economy inherent in the program, however, should make it easier to meet such special needs when they arise.

LANGUAGE IN THE MIND: A STRATEGY FOR LEARNING

William Chisholm*

I would like to begin at the beginning, with philosophy, the foremost of man's delights. (So far as I can see, the only thing the fellow who designed the Tower did right was to put the philosophers on the top floor.) Philosophers typically ask these two questions no matter how they formulate them: What does a man know? How does he know it? Teachers may well ask these same questions and then set about to follow them logically to a set of consequent questions: 1. What may be taught? 2. Why should it be taught? 3. How may it be taught? It is with these three questions and the answers that they have provoked that the freshman English program at CSU has evolved. The answer to "What does a man know of his language?" will take up half of this discussion. Answers to the subsequent questions "What may be taught, Why and How?" will form the second half. A teacher must ask himself what his students know. Without asking this question and getting some kind of answer, what can the basis of any instruction be? Some parts of the answers suggest, I believe, that our program of instruction in freshman English is innovative in petty ways. We might say "My students know x. At the end of my instruction they will know x + y. Since there is only x, y, z (z being open-ended), I can confidently leave "z" to the next fellow." This formulation is silly in many ways. Nevertheless, there is something to be learned from it. As far as the English program is concerned, the situation is this: First, the question: What do our students know? Answer: Just about all they are ever going to know of the English language. They have been in this condition for more than one-half of their lives. They each have acquired in their heads what many have called "a linguistic device". This explanatory device is such that the rules of English structure are used to solve any and all linguistic problems; that is, the students are fully capable of speaking well-formed English sentences. In order to do this, they must be in possession of an adequate grammar (= explanatory device) of English. Obviously, this grammar of English is not a paperback that they carry in their tote bags or hip pockets. It is knowledge. It is a competence (in the neutral, philosophical sense of the term) that I have named a device. It is as if there were a magic box embedded in the brain. The input to the box from birth is impression, cognition, thought, and especially vocal, social data. The output is utterance and understanding. Linguistic competence is a device, then, in the sense that we use it to generate sentences.

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By definition no one knows what goes on in black boxes, but some things are known about what the grammars in our brains are like. On the basis of a random and degenerate linguistic experience, every human being proposes, rejects, proposes again, and modifies explanations of the native language. The brain constructs a theory that adequately explains what sentences are and what the rules are for matching streams of vocal sounds with meanings. Innately endowed to do this work, all humans succeed in becoming the foremost grammarians in the world.

It will be of some help to consider more specifically what I have been describing generally and theoretically. Consider this sentence: "Sundance rests on his haunches, staring back down the way they've come." That's a perfectly ordinary sentence. It had no existence before the moment that the scenarist of the popular movie "thought it up" as he tried to describe something he wanted in his movie for himself, his director, and his actors. It had no existence except as a potential enumeration of the black box. Here are some facts about the sentence: (1) There are exactly two ways that the 12 words of the sentence may be arranged from a possible number of arrangements of over 200 million.

(2) There is exactly one circumstance out of an infinite number of circumstances that could provoke the sentence. (3) The sentence carries a complexity of meaning that is not difficult in any way for a speaker of English to understand. (4) The sentence is technically unambiguous. (5) It follows the rules of English grammar to the hilt. (6) The sentence (if spoken) consists of 50 human speech sounds, none of which has ever happened before. (7) The slightest mistake in speaking the sentence would be noticed by any of us: "Sundance rests on his haunches staring back down the way they've gum." The 48th variable does not belong in the set. If the mistake is a special one of this sort: "Sundance hests on his raunches staring back down the way they've come." then, despite the fact that neither "to hest" nor "a raunch" exists in English, the noise in the channel may be successfully translated. That stream of noise would have communicated something it didn't say. (Considering the amount of noise in the typical channel that our students usually find themselves in, it's a wonder that the race has not retreated to non-verbal communication).

These facts are remarkable. The speaker of the sentence located one of two ways that his words could be arranged. He had over 200 million choices. He found a stream of vocal sounds that carried a meaning for which there could be only one occasion. He communicated a meaning, really meanings, that neither he nor his listeners had the slightest trouble contemplating. Most importantly, he expressed his meanings by consulting wholly abstract linguistic rules and unerringly following them. I leave to you to consider the implications of the remaining mind-boggler -- that the actual sounds he chose (50 of them) (I'm thinking, of course, of his saying this sentence not of his writing it down) happened for the first and last time when he spoke.

If you and I did not have language in our heads and yet we could still somehow communicate with one another, and if one of us proposed to the others that we set about to invent a human language, the rest of us would have no way even to begin to think about what the nature of the proposal was, let along to anything about inventing a natural language. Comparing the complexity of the problem of lobbing a package to Jupiter with the complexity of any human language is like comparing a photon with the universe. The "Sundance" sentence, then, is a small miracle. But there is nothing more commonplace than a sentence. Thinking merely of the observations I made about it, from among very many observations that may be made, equally intriguing, there can be no denying its complexity. More pertinently there can be no denying the miraculous complexity of any sentence any of our students write. Here's one: "A mother telling her three-year-old son not to go outside the yard will not use the same tone or words that she would use if it were her husband she spoke to." Here's another: "Mono-syllable (sic) words and short sentences are easy for children to understand." (There are rough edges on both of these sentences but we needn't be distracted by them). With these as with all sentences, it is more than a jiggling of a verbal kaleidoscope that we encounter. Nor are sentences formed by shaking words out of a hopper. Think of it this way: Suppose that that second student sentence had been: "It is easy for children to understand short sentences," instead of "Short sentences are easy for children to understand*", or suppose it had been "For children to understand short sentences is easy", or "Children understand short sentences easily." Would the same meaning have happened four times, or would four different meanings have happened. The answer, of course, is that the different sentences would have carried the same meaning. We know this to be true, and so do our students. The only satisfactory way to explain how it is that our students know this is to say that they know English grammar.

It is not possible to give a very satisfactory description of a competence like this because there is no time. We need eleven weeks to begin to do it with the freshmen. But let me try in a minute or two to sketch the principles. Incidentally, the kind of grammatical exercise I am about to lead you through is a good example of the kind that our students face.

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*I'm using abbreviated versions to avoid complicating the discussion.

If we start with a meaning like that which is expressed in A: "Children are easy to understand,*" we can notice that that meaning is captured again in an entirely different grammatical structure, B: "It is easy to understand children." If we now take C: "Children are eager to understand," and try to express that meaning again in the structure using "it", we get D: It is eager to understand children." Something has gone wrong somewhere. Although the grammatical relationship between A and B appears to be precisely the same as that between C and D, those grammatical relationships can NOT be the same. And we know they are not. If they were, then the A is to B as C is to D would work out. The grammatical structure of the first sentence in each paired set:

Children are easy to understand.
Children are eager to understand.

merely appears to be the same. But the fact is, in grammatical terms, that the subject of "to understand" in "Children are easy to understand" does not even occur in the sentence. The person or persons who do the understanding are not mentioned.

In the other sentence, "Children are eager to understand", the subject of "to understand" is "the children". Children are eager to understand.

This partial grammatical analysis merely explains what a small fraction of our grammatical knowledge actually is. In this case, as in many others, a knowledge of English grammar is such that it provides understandings of sentences partly on the basis of what is not in them.

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*We are now dealing with a meaning that is quite different from the one that was expressed in the previous 3 sentences.

(The first week of October, the first week of January, and the third week of March have provided our students with a shock from which we hope they will never recover. When you confront a student with his mind, you melt his brains.) I hope the point of this is clear. We had two sentences with exactly the same structure, yet we understood them in entirely different ways. As many of you may know, this fact more than any other has been responsible for the revolution in grammatical studies in the past generation. This revolution has spilled over into our classrooms. Not the noise and confusion of it, but the challenges and the insights of it.

So we are near an answer to the imperative question: Name something students know? Answer: Students -- all of them -- know as much of English as anyone. They know exactly how to form the sentences that they wish to speak and to decode sentences that others wish them to hear. That is the answer to the question: "What do our students know of the English language?"

We ask these two questions next: "What can we teach them?" "How can we make use of what they already know?"

The answer to the first question is: "Precious little" -- not because there are not vital things to teach, but because we feel it is more important for them to learn than to be taught. (It is here that we make use of what they already know.) We get students to induce knowledge about English from their knowledge of it. What I mean in familiar terms, is that our technique is inductive. It is inductive because there is a necessary answer to that second question about what use we can make of their present knowledge. The students are led to make analytical statements about the form of the sentences that they speak. The question, "What can we induce our students to know?" is more apt, then, than, "What can we teach them?" They learn to "do" grammar. In this way, they add y to x -- knowledge about language to knowledge of language. This is extremely important. There *are* two kinds of linguistic knowledge: knowledge of language, and knowledge *about* language. Nothing whatever is learned when one learns to say that interrogative sentences ask questions or that verbs express action. But something of consequence is learned when an explanatory analysis of questions or verbs is undertaken. By means of such an analysis, one explains something about the structure of the language. And it is this that we are after: an explanation of the structure and the form of the native language.

Our students' knowledge *of* English is immense, as I hope I have made clear; their knowledge *about* English is pitifully small. Frankly, it is non-existent. If it were merely that their ignorance was profound, it would not be so bad. But the situation is much worse. They know thousands of things *about* the English language and almost everything they know is wrong. They believe that writing has something to do with language, that Chaucer wrote in Old English and so did S.T. Coleridge. (I have been afraid to ask about T.S. Eliot). They think that there are five vowels in English (and sometimes "y"). They believe that they do not speak a dialect. They derive English from Latin. They think four-letter words are slang. They not only believe that "interrogative sentences are sentences that ask questions" they believe it is virtuous to know such nonsense. They will willingly swear that verbs express action, even the verb "to die". (Well, I said they know thousands of untruths about English. I will not list them all!)

The point is this. The part of their brains that does not contain the knowledge of English that I described a few moments ago is jammed with ignorance and misinformation *about* the language.

Under such circumstances as these, we would be criminally negligent if we did not encourage our students to examine rationally and critically the opinions they have about their language. More importantly, since the English language *is* our subject, and since, happily, there exists an authentic body of knowledge about it, what could our reasons possibly be for not passing on this knowledge?

The reasons for teaching it are richer than this, however. Our students learn a good deal in our program about the linguistic knowledge that their minds possess. The consequence of this is that they learn a good deal about their minds. There can be no greater education than that (and so I slip back into philosophy).

So, we teach the raw knowledge by getting students to induce the same insights that modern grammatical studies provide about English structure. We do not teach linguistics. We do teach the main facts about the history of English structure, and also the social and regional dialects. We consider these two topics to be of considerable importance. One of the astounding facts about PhDs in English is that many of them have never studied systematically either of these topics. So, we are plugging a gap but it is not for this reason that we do so. We teach such material because any education in language is unthinkable that skips fundamantals like these and not because many PhDs are ignorant of some crucial facts about English. Historians do not teach American History because it is their specialty. They teach it because a man who does not possess it is ignorant -- so it is with us. But it is no easy matter to teach linguistic history or dialects.

Part of the difficulty is that our students come equipped with bins full of ignorance and misinformation. Most of them who have thought about the matter at all, have decided that Old English is an "uk-uk" language roughly comparable in degree of complexity to any American Indian language. After all, with only a hundred or so words in the vocabulary pool, and nothing much to talk about, what do you expect? Some of our students get away from us still believing that the highly synthetic nature of OE structure is somehow inherently inferior to the analytical system of Modern English. Worse, many think that valid views on this subject are worthless. Such views have nothing to do with what they call education. They want something that they vaguely describe as the necessary tools and skills to get a job, even education majors do! Little do they know that when they get their first jobs at East Tech or JFK or Parma High the students there, and their parents, will demand the same "skills." Then, they will wonder what these skills really are and why everyone is so agitated about them.

They will learn that all those hours, weeks, months, and years spent driving those so-called "skills" into their students' heads are wasted. No one has ever demonstrated the slightest hint of a positive correlation between such instruction and the acquisition of writing or reading skills. Until such time as someone notices that you can not learn to run before you learn to walk -- and we believe that we have correctly noticed this -- that you can not have knowledge of writing before you have knowledge about language, we will do nothing but waste money and time. Trying to get one without the other is like trying to build the University Tower without tools.

Having acquired knowledge about the form, history and dialects of English and having learned something of what their minds are like, the freshman English students in the second quarter of our program of studies take up the matter of English use. Although there is no sure relationship of effect between the learning that goes on in the first quarter and that of the second, it is on the basis of an understanding of form that the topic of language use is studied. This is one of the suppositions at the heart of our pedagogy. We are confident that knowledge about the English language precedes informed use.

It may truly be observed that the adult population in our society is the ready victim of sloganeers and propagandists. In simple language, we vote for liars and we buy objects for which only advertising has provided a need. In the Fall of 1970, Bella Abzug announced that "A Woman's Place is in the House" (capital H). I would hate to think that the lady got elected because she knew more about how to use the language than her constituents. But I know better. That is how she got elected.

Although the English Department does not see its role as protector of the innocent, we do feel that the rhetorical and compositional facts of English use are to be taught. Otherwise, we risk sending our students out into a cruel world where people on Pensylvania or Madison avenues know more about how to use the English language than they do.

Let me say it straight out. We know how to teach writing and reading skills - true skills. Half of the job gets done in the first term. The other half begins this way: with a decent respect for English words, more specifically, with instruction on how to open a dictionary. The well-made dictionary is the repository of essential facts about English words. A person cannot crack the code of a dictionary without special training. This instruction we provide. If we did not, our students would continue to think of it as a spelling book. The difference between "The hydrogen dioxide inundated the subterranean chamber" and "The water flooded the basement" is the difference between the hardware and the software of the English wordstock. All matters of diction and tone are describable in quite simple terms based on the gross distinctions exhibited by these two sentences. In the first term, students learn to handle a generally abstract explanation of the phonological, the morphological, the syntactic, and the semantic forms of English sentences. In the second, they begin by learning how to study and use words. Then, en route to the hard-won satisfaction of successful composition, they study the broad principles of rhetoric, including the effects that certain orderings of sentence elements can have; the usefulness of paraphrase, the power of syntactic substitution, the utility of expansion and modification, the structure of metaphor, and so on. They study the dozen or so rhetorical devices that manifest themselves (one or the other) in every paragraph or stanza of consequence that has ever been written.

But we do not fool ourselves. None of this necessarily leads to the writing of plain English. The trouble is that good writing is not so much a skill as it is an art. In fact, it is not really writing skills that we try to develop. It is that which precedes writing skills, the principles of language use.

Each of us faces a cataract of linguistic events in our daily lives. friends commune with us or communicate with us; our enemies howl at us; newspapers and magazines seize our eyes; signs blink at us; TV images massage us; even our minds rattle away. In such a circumstance, the well-equipped college student is the one who has some clear understanding of the form and the utility of linguistic material. Knowledge of the form that the principal linguistic objects in the world have (sentences), and possession of a means to decide how these objects may be used to achieve clarity and wit, are valuable goals for any instruction. They are our goals, and things seem to be working well.

One final word -- In a routine discussion of the innovative aspects of our instruction, the following topics could very well be mentioned: videotape instruction; the writing laboratory; staff training. But these things seem to us to be more obvious than innovative. Who can doubt that there are some aspects of our subject that are better handled on videotapes. It is better to show people from various parts of the country speaking their regional dialects than it is for the instructor to describe regional dialects. Linguistic behavior in its natural state is best observed through the window of the TV screen. Second, since we have decided that writing is a special problem, we have devised special means to treat it. This special means is the Writing Lab. There, intensive instruction on writing is provided on an individual and small-group basis. Finally, the staff in the writing lab, and more importantly, the instructional staff, are well-trained specialists in their fields. Teaching the primary materials of the course of instruction is not left to general experts with an MA in English, but rather to those who are hired on the basis of their training in grammar and rhetoric. In addition, since the inception of the program, staff seminars have been conducted on a regular bi-monthly basis. The efforts here, of course, are to enlarge upon the competence that the instructors have, to organize a coherent program, and, in particular, to test the philosophy and the materials of the course. "What's working?" we ask when we meet. "What isn't working?" "Why?" "What can be done about it?"

None of us pretends to have found final answers to any of the important questions: "What does a man know?" "How does he know it?" "What may be taught?" "Why and how should it be taught?" But these are questions that haven't been put seriously to an English curriculum in 700 years. Our answers are broad in that we have large hopes, narrow in that we stick to our subject. It is easy to collect the freshman class in groups of twenty-five or thirty and then sit around and rap with them about relevance and black rhetoric and multimedia and The Great Gatsby, sending everybody home every two weeks to write a theme on the theme of The Great Gatsby. But that's not a plan. That's a ploy.

Our students like all students are in a world dominated by language. Our plan is to truly equip them to deal with their linguistic experiences.

LANGUAGE IN THE MIND: A RESPONSE

Ferris Anthony*

Bill Chisholm was kind enough to provide me with an advance copy of the paper which he just presented to you, and also a copy of the text currently in use in the freshman English program. I spent some interesting and enjoyable hours with both documents and, after reviewing these materials, I have formulated some critical comments and questions which I wish to share. Please note that I use the term "critical" in the original Greek sense of the word, and in that sense it does not mean negative.

At any rate, it seems to me that Professors Chisholm and Milic and the other members of the English Department are to be applauded for developing this freshman program. All of us, no matter what course we teach, if we ever require our students to write compositions, are usually disturbed by the general quality of their writing. And it has, therefore, become commonplace to remark, "Why doesn't the English Department teach students how to write?" or some variation on this same theme.

Further investigation into this writing problem reveals that the traditional approach to English, i.e., the typical freshman 101 series, was concerned with grammar and rhetorical skills. In short, it dealt with usage, which somehow was supposed to contribute to writing skills. It has taken us many years to realize that a study of usage, especially over a 13-year period, has little effect upon a student's ability to write. So, I say again, the English Department is to be applauded for a progressive step forward.

Second, and more to the immediate point, I find little to disagree with in Dr. Chisholm's paper. He builds a strong case for a study about English and the work of linguistic scholars in this century has certainly given us evidence that we do indeed know the rules of the English language by four or five years of age. In theory, then, the idea of studying about the language seems valid. However, given that a study about language is valid in itself, there are still some unanswered questions about the application of this concept in the freshman English program.

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First, on a philosophical level, I would like to add several questions to those already posed by Dr. Chisholm. Besides asking "What may be taught?", "What should be taught?", and "How may it be taught?", I add, "What does the student need to know?" and "What are the ultimate goals of our instruction?" These questions, of course, are closely related to Dr. Chisholm's, but in this form they force us, I think, to examine ultimate goals more closely and to define specific objectives more clearly.

Dr. Chisholm's answers to the questions he raises focus on the subject matter itself. I am suggesting that we also need to focus on the student and the ultimate outcome of our teaching and the student's learning.

Second, on a more pragmatic level, I must still raise the question of writing. I agree with Dr. Chisholm that writing is an art, but an art, by definition, must be practiced -- it requires doing. And given the notion that the principles of language must precede the development of writing skills, the question remains -- "How much research do we have to show that a study about language improves writing skills?"

Is there any conclusive evidence that a study of transformational grammar -- in lieu of other grammars -- will lead to improved writing? Is it possible that students may perceive transformational grammar, which is a complex study, as merely a substitution of one set of rules for another? And is it also possible that the first hurdle which we must overcome in helping students to improve their writing is to eradicate their fear of rules?

Third, and closely related to this last point, it strikes me that the text material might be rearranged to capitalize on student interests. The first 20 lessons of Section One focus exclusively on the form and structure of modern English. Yet it seems to me that students are more likely to get excited -- or motivated -- if we begin with a study of propaganda, regional or social dialects, or even a history of the English language.

The program, as currently planned, may also be more detailed and complex than is necessary for the average student; and I wonder if in its present form it might be more appropriate for the English major. What I am asking -- in a roundabout way -- is whether this approach to language study is the only approach appropriate for all students. I find it difficult to defend the concept of a single approach to teaching anything in an age of individualized instruction and in an age when many instructors are paying more than lip service to the concept of individual differences.

I am also suggesting that, instead of requiring all freshmen to take this series of courses, alternative courses (including courses which deal with the art of writing) be offered for credit. The student, therefore, might be required to take two out of three or three out of four courses, including various sections of the current program. Some consideration might also be given to the idea of offering the program at a sophomore or upper-division level, since there may not be any necessity to limit it to the freshman year. In short, is it more appropriate at advanced levels?

While I am on the subject of alternative approaches, let me raise a question about the writing lab. As I understand it, the writing lab is currently thought of as an auxilliary activity and, in fact, it seems to be viewed as a good and necessary remedial function. However, I am still unclear about the exact nature of the writing lab and about how closely it articulates with the entire program. And I am suggesting that it might be appropriate for all students.

This leads me to another consideration; namely, the entire question of evaluation. How has the total program, including the writing lab, been evaluated? Have students, department members, and even other departments been involved in program evaluation? Has the program met or is it meeting its originally stated goals, and what are those goals?

Finally, there is a question which is tied up in the concept of Black English. Realizing the current definitional controversy in this area -- i.e., whether Black English is, in fact, a unique language, or whether it is merely a dialect of standard English -- I approach this question somewhat gingerly. There does not seem to be enough evidence at this point to refute or to support either position. However, if we assume for the moment that Black English is a unique language, then there comes a question about the validity, propriety, and relevancy of linguistic study for Black students based upon standard English. If, on the other hand, we proceed on the assumption that Black English is merely a dialect of standard English, we may wake up several years from now and find out that we have proceeded on a false set of assumptions. I am not sure how we should handle this, but it seems to me to be a critical problem.

Let me conclude by re-emphasizing that the current program has much to recommend it. In making these comments and in raising these questions, I am conscious of my own limitations in this area, but I hope that in raising honest questions about the teaching-learning process, we can all come to improve the teaching function of this university.

CREATING AN ALTERNATIVE LEARNING ENVIORNMENT IN INTRODUCTORY MATHEMATICS

Richard H. Black*

The title of this paper may be misleading when it refers to the "creating of a learning environment", alternative or regular, in introductory mathematics. A more accurate (and more modest) description would be "creating an alternative immediate learning environment", where "immediate" includes all the things that are usually considered controllable (or creatable) by the instructor (lectures, discussions, reading assignments, tests, etc.) in contrast to the background or "non-immediate" learning environment: the other activities and influences acting on the student (and also on the instructor), both on and off campus.

I suspect that the relative effect on learning (however measured) of the non-immediate environment is greater than instructors will usually acknowledge. Or do we acknowledge only its negative affects, which can be used to explain the failure of some students in our class? In any case, I won't consider the possibility of changing the non-immediate learning environment as in the scope of this paper. I will not deal with cluster colleges, remedial "how-to-study" programs, or even the subjects other than mathematics that our students should or should not be simultaneously taking. However, you may detect, in the description to follow of our alternative immediate learning environment, an implied recognition and accommodation to some features of the larger environment. Of course, we have all always done this, if only in a trivial sense: e.g. at CSU we try to use some version of the English language to convey information, at Tokyo U. we'd presumably try Japanese.

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Let me try to describe the regular or conventional learning environment in Introductory Mathematics at CSU. Specifically, I refer to the sequence of three courses called Mathematical Concepts I, II, III; numbered M 135, 136, 137. They have existed since 1968 as service courses for both Business College majors and Social Science majors of the Arts and Science College. That a sequence of math courses aimed at this combined group of students is common college practice seems to be indicated by the many new textbooks on the market with titles such as "Mathematics for Business and the Social Sciences" or "Mathematics for Management and Behavioral Sciences". I do not think there was ever any intention that these courses would also serve other categories of students, yet they are occasionally taken by engineering and physical science majors (for what I consider to be strange reasons) and also by humanities majors (for the not-so-strange reason that their science distribution requirements can be satisfied by this "lesser-evil" mathematics, rather than, say, physics, chemistry, or a regular calculus course. There has recently been a proposal in the Math Department to establish a separate "humanities" course for such students). The enrollment in the first quarter, M135, has been about 50% Business and 50% Arts and Sciences. The percent of A & S students declines in the second quarter, and the third quarter is almost entirely Business students. If the present trends continue, there will soon be 1000 day-division students taking one of these courses each quarter.

The subject matter content of these courses can be broadly described as an introductory treatment of:

(1) sets, relations, and functions (the "new math"),
(2) linear systems; including vectors, matrices, and linear programming.
(3) probability and statistics,
(4) exponential growth; for which, depending on the textbook used, the exclusive example might be money, i.e., compound interest.
(5) differential and integral calculus.

I know that to be in good form "instructional technology-wise" I must include in my course description not only content but also the "behavioral objectives". I do not think I am being unfair to the math faculty when I state that, if asked to give the behavioral objectives of a course, we would answer (after the phrase is explained to us) that the student should "know the material", and for the type of math course we are discussing here the evidence that he "knows the material" is the ability to pass a test consisting of problems that can be solved if one "knows the material". This may seem primitive to those familiar with more sophisticated and precise statements of behavioral objectives. I think there is room for improvement. For example, we might think more about the exact circumstances and roles in which our students will later use mathematics. But some writers on behavioral objectives, I have noticed, will grant that in math the objectives perhaps are implicit in the material, perhaps even explicit, if, as is usually true with math textbooks, the introduction of each new concept is followed by exercise problems for the student; problems that can be solved using the new concept.

The features of the conventional learning environment so far described (content and behavioral objectives) have not been changed in our alternative environment. We use the same test, and the same type of test questions. Even if we were inclined to make a change (and we really have not been so inclined) there is a practical reason not to. Some students switch from alternative section to conventional section, or vice versa, as they progress through the three-quarter sequence. We think it desirable that they can easily make such switches.

I will now complete my description of the conventional learning environment by giving the features that have been changed in our alternative environment. The students are enrolled in sections of 30 to 120 (Yes, 120 is now-a-days conventional!). If the section size is closer to 120 than to 30, it is considered to be 2/3 of the instructor's load, and he or she may then also have a grading assistant. The class meets the standard four times each week, the time divided into formal lecture, further exposition of examples in the textbook, the working by the instructor of exercises from the textbook that had previously been assigned as homework, short tests, hour tests, "post-mortems" on returned tests. Some interaction of students with instructors also takes place during the instructor's office hours. The percent of time devoted to each of these activities varies with the instructor; so do the standards for final grade assignment. There is no common departmental final exam, although occasionally two instructors whose sections are in the same time block will collaborate on a test.

Rather than follow my now-completed description of the conventional environment with a similar treatment of our present Winter 1972 model alternative environment, I will give an abridged history of the development of the alternative since 1969. Thank God, no one kept a detailed log or diary! The development was certainly not a case of proceeding from original axioms and postulates through rules of inference to a logical conclusion. It was more a case of tentative conjectures, experimentalism, pragmatism, "tuning up the engine", and quite a bit of serendipity and opportunism. If I am obliged to state some dominant principle that guided us, the best I can think of is one I call "Pave the Footpaths", after a letter-to-the-editor that appeared some years ago in the student newspaper of another campus. That campus had some new buildings (like CSU), and big expanses of grass between them (unlike CSU). A controversy developed about placement of connecting sidewalks. The letter suggested waiting until student had worn footpaths in the grass and then paving them.

In spring 1969, Joe Egar, Len Bruening, and myself were each asked to take a section of 120 students in Math 135 for the coming Fall Quarter, to be followed by similarly sized sections of 136 and 137 in Winter and Spring. At that time sections of 120 were not yet called conventional; so "Van" Van Voorhis, then Math Department Chairman, suggested we might try some innovations. I was then already making some experiments with my Math Concepts sections, and the three of us decided to collaborate, continuing in the same direction as I had started.

A change from the conventional ought to imply that the conventional was somehow deficient. As I have already admitted, we had no quarrel with the conventional, behavioral objectives for our students: that by the end of the term they should demonstrate by test that they "know the material". But at that time, and even now, I thought that there were two respects in which the conventional was deficient: (1) Our students vary widely in their previous mathematics preparation and in the time and effort they are willing or able to devote to the courses; yet the conventional section is essentially lock-step; (2) For the magnitude of the operation, i.e., enrollment approaching 1000 per quarter, conventional sectioning is inefficient: a system of "one-room schools" where there could be an "educational park". I choose this analogy deliberately as one for which I would expect wide (but not unanimous) agreement that increased magnitude made an improvement possible. I am well aware that often (maybe even usually) it does not work out that way. Now that college textbook publishers have a market perhaps 10 times greater than it was 25 years ago, are the books any better?

As to the direction which I said I had already started: I have long held the idea that frequent tests are good for the student, and have put the idea into practice when feasible. I do not remember why I first started doing that, but I do recall meeting a math graduate student who reminded me that I had been his instructor when he was taking an algebra course as a freshman on probation--and he credited my every-other-day quizzes with forcing him to learn and like mathematics. I have just read Skinner's Beyond Freedom and Dignity, and this episode was an example of a reinforcement (to me) that might also be a superstition.

Egar, Bruening and I adopted the frequent-test practice, along with the practice, borrowed from programmed instruction, of letting the students see the right answers immediately after completing a test. To avoid the "lock-step deficiency" we set up a testing room, open 4 hours every day, operated by a graduate assistant and undergraduate student proctors, to which the students of all three sections could come at any time to take tests. The three instructors all contributed to a large pool of test problems, so that problems for a particular concept existed in many versions, and also in three levels of difficulty called "A", "B" and "C". Tests could be taken over if the student wanted either to try a higher level of difficulty after successfully completing a lower level, or to try over again the same or lower level if his first attempt was unsuccessful. Each student, after checking his answer with the "right" ones (which were sometimes unintentionally wrong) marked his self-score on his test paper before turning it in. These self-scores were later sample audited by the proctors and instructors, much like the IRS checks our income tax returns.

Each of us had our own lecture section. Because no class time was used for testing or discussing tests, we were able to schedule one of the four days each week as an optional review session for those having difficulty keeping up.

The first quarter was considered successful, and the system has continued, except for summer quarters, ever since. There were difficulties but they were always considered "technical", not an indication of something wrong with the basic concepts, and we would immediately start planning how we would correct that technical difficulty next quarter. I recall that at one of the ITG meetings last Fall someone cited the quarter system as a handicap to innovation. I would claim our effort as a counter-example; an innovation that was accelerated because of the 11-week cycle.

The technical aspects of the system involved decisions to be made on such things as: how copies of the problems would be reproduced, what size and shape for the student's work sheet, where records would be kept, to what extent we should computerize the record-keeping, what hours for testing and tutoring, what could we do to discourage procrastination in test-taking, what to do about the newly discovered cheating scheme. The decisions were always subject to change after one quarter, and often were changed. One firm bit of advice to anyone contemplating trying a system such as ours: at least one of the instructional team, and preferably all of them, must be willing and able to concern themselves with the many seemingly trivial but nevertheless crucial details.

I will conclude by giving three interesting ways in which the system has changed from 1969 to 1972, and some tasks remaining to be done. First the changes: (1) We started with the concept of several instructors, each with his own lecture section, sharing a testing facility; somewhat like a group of doctors, each with their own patients, sharing a laboratory. We have now altered the arrangement so that each instructor is a "specialist" in one or more "mini-courses" and each enrolled student takes all the mini-courses in some order during the quarter. In the process we have lost the concepts of "my student", "your student", "my instructor", "your instructor". We even encourage the students to think of the members of the instructional team as interchangeable parts. They can come to the office of any one of us for any problems they may have.

(2) This change evolved from the initial arrangement by successively applying the "Pave the Footpaths" principle. We started with three hours per week of lecture-discussions and one hour per week of review and "questions from the audience". This has been altered to 16 lecture hours per quarter (less than two per week) in a room that may have a seating capacity equal to only half the enrollment, plus maintenance of a "help" room next to the testing room, open 6 hours every day, in which graduate assistants, undergraduate assistants, and

sometimes the professors, will discuss any material of the course at any time with any students that come there. The discussion is "laboratory style" with the assistants walking around the room to wherever students are seated or standing.

Instead of talking to one of the assistants, some students prefer to just look at material previously written on flip-chart sheets hanging on the walls or to start an ad-hoc "peer-group discussion". The room is open, incidently, to students in other math courses.

(3) We started with the test problems divided into the A, B, and C levels of difficulty, with the final letter grade determined by how many of each level the student has successfully done. We found that of the students who got a final grade of B, more got it by accumulating a just-sufficient partial set of A test grades than got it by accumulating a larger just-sufficient set of B test grades. This and other results, led us to two conjectures: (1) that a "Law of Minimum Effort" was governing most students. They tend to obtain the grade they get in whatever way requires the least effort. (2) that the "real levels of difficulty concerned how many single-concept tests (of whatever supposed difficulty) a student could pass during the quarter, and how many concepts the student could handle simultaneously in a multiple-concept review test. We abandoned the A, B, C test in favor of a three-stage hierarchy of 16 single-concept pass-fail tests (one for each of the 16 lectures), 3 or 4 multi-concept review (or chapter) tests, and the final examination. The requirements for final grades of C, B, and A are cumulative, involving, respectively, only the single-concept tests, single and multiple and final exam. The final exam is "by invitation only" to the "candidates for an A".

Now some tasks remaining to be done: (1) I feel that the live lectures, the only vestigial lock-step feature of the system, should be eliminated completely. The department has already purchased some combined magnetic audio player-slide projector equipment with which we hope, by next Fall Quarter, to have a "canned" version of each lecture that would be available to students for individual or small-group study at any time either through the CSU Library or our Help Room.

(2) If this alternative learning environment becomes stabilized in its technical details and remains acceptable to the department, its quarter-by-quarter operation should be deliberately made non-dependent on particular personnel. My previous experience with a university computer center makes me all too aware of the danger of commitment to a complex system if there is not such non-dependence.

(3) An analysis of the system should be made as to its effect on students compared to the effect of a conventional system. This would include both terminal performance comparison and also attitudes of students toward both systems. We have done some comparison of final grades, and we know from unsolicited comments that an instrument that could record student attitudes toward our alternative system would have its indicator needle go off both ends of the usual "strongly-disagree" to "strongly-agree" scale. But much more could be done. It would be useful to know, for example, if the students who strongly disagree or strongly agree could be predicted from other of their characteristics.

(4) Finally, the effect of such a system on the faculty should be investigated. I gather that efforts similar to ours are proceeding on many campuses. Some of the practitioners have predicted or advocated drastic changes in the roll of teaching faculty as a result of such inno-

vations. I see a chance for cause and effect to be reversed; a chance for such innovations to be a result of a role that teaching faculty choose for themselves from among several roles still possible.

CREATING AN ALTERNATIVE LEARNING ENVIRONMENT IN INTRODUCTORY MATHEMATICS: A RESPONSE

Frank Lozier*

First, I'd like to expand on Dr. Black's remarks about the behavioral objectives of math courses. He is perfectly correct in saying that the behavior used as a basis for assigning grades is the working of problems. However, it should be pointed out that there are two kinds of problems which might be used for this purpose. One is the "cookbook" problem, i.e., a problem essentially the same as one the student has already worked or seen worked. The other is a problem which may be completely unfamiliar to the student, but which can be solved using only the material which has been presented in this course. Now most of us fancy that we grade our students on the basis of whether or not they understand the material presented in the course, and would agree that the second kind of problem affords the best measure of this understanding. In fact, however, most of us grade on the basis of the first kind of problem. This discrepancy is easily explained in terms of Dr. Black's most recent grading system. His single-concept tests consist of problems of the first kind while his multi-concept tests, which must be taken to earn a B or A, consist of problems of the second kind. Dr. Black's grade statistics show that nearly 70% of his students receive a C or less. Therefore, one can conservatively estimate that if he used only multi-concept tests, more than half of his students would fail. This situation is not peculiar to Dr. Black's system. To put the matter bluntly, most students in beginning math courses do not really understand the material, and we accommodate our grading practices to this reality. Now, I for one, would applaud anyone who devises an "alternative learning environment" which alters this reality; such, however, is not Dr. Black's objective.

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In addition to the terminal behavioral objective discussed above, I suspect that most of us have other behavioral objectives in mind when we teach. Math instructors differ much more in the latter than in the former. One may, for example, attempt to exert some control over the students' objectives. In this respect, instructors vary considerably. Some try to force students to learn. Others merely try to provide the best possible opportunity for learning. Still others sympathize totally with the students' desire to get a grade. Furthermore, instructors who worry about whether or not students learn vary considerably in the extent to which they try to control how students learn. In math courses in which the basic objective is the working of pattern-type problems, students generally learn by attempting to work problems, comparing their solutions with the correct solutions, and doing this over and over again until they are able to work the problems correctly. Math instructors vary in the extent to which they try to force students into this mold. Some assign homework and collect and grade it. Others assign homework and provide the correct solutions only after the students have had a chance to try to solve the problems themselves. Still others pass out sets of solutions to a selected list of problems at the beginning of the quarter and let the students do with them what they will.

It seems to me that the very structure of Dr. Black's system reveals a commitment to force the students to learn and to control how they do it. He gives a large number of short tests, admittedly for the purpose of forcing students to learn. Also, although he wishes to allow students to decide when they are ready to take exams, his system has built-in constraints to prevent them from waiting until the end of the quarter to take all their exams. Finally, he permits students to retake tests until they pass them, thus building the conventional learning model into the exam system itself. My prejudices, on the other hand, are at the other end of the spectrum. I try to structure my courses in such a way as to maximize the opportunity for learning but to exert no control over it; when time permits I pass out sets of detailed problem solutions which the students may use as they think best. Thus, it must be apparent that the difference in our educational philosophies puts me considerably out of sympathy with Dr. Black's system. Of course, so long as we both run our own courses, this is purely a matter of personal preference. But, if at some time the math department should decide to adopt a system for the servicing of all students in some sequence, such as basic math, then it would have to decide, as a matter of policy, how its limited resources of time and money should be expended.

Finally, I would like to comment upon Dr. Black's claim that his system nearly eliminates the lock-step inherent in conventional courses. Lock-step means, I presume, that all students do the same thing at the same time. From Dr. Black's remarks, I infer that he is thinking primarily about the "same-time" lock-step. I confess to reservations about whether he has really eliminated it. In the first place, while Dr. Black's system allows students considerable freedom in deciding when to take exams, this appears to me to be a freedom to choose when to do tasks that in a conventional system one is not required to do at all. To put it another way, I would find it much less oppressive to take a few exams at scheduled times, than to take 20 exams at times of my choosing. Furthermore, Dr. Black is still bound by the quarter system. Good students could complete the requirements of Dr. Black's system in less than a quarter, but what are they going to do with the rest of the quarter? Poor students, on the other hand, must still complete the requirements by the end of the quarter; how many such students can profit by working at a slower pace at the beginning of the quarter and then working at a necessarily accelerated pace during the rest of the quarter? However, one must grant that, if the administration ever makes it possible for us to award credits other than at the end of each quarter and then only in amounts contracted for at the beginning of the quarter, Dr. Black would be prepared to take advantage of this freedom as none of the rest of us are.

Dr. Black says little about the "same-thing" lock-step. But the feature of his system which is most attractive to me is that it does in fact, reduce this kind of lock-step. In designing exams for a conventional course, one can use only simple problems, in which case one gives A's primarily for outstanding accuracy in arithmetic and algebra, or one can use only difficult problems, in which case one grades all students on the basis of how close they can come to solving A-level problems. Even an exam consisting of problems of varying levels of difficulty has much the same effect as an exam consisting of all difficult problems, because it is impossible to convince poor students that they should concentrate on the easy problems; all students study for and attempt to do the hard problems, which for many of them is a waste of time. Black's system, while giving B's and A's only for the working of more difficult problems, allows C-students to earn their C's by concentrating on problems they are capable of doing. I suspect that poor students learn more under such a system than under one which encourages them to concentrate on problems they are not capable of doing.

THE CONTINUOUS FEEDBACK METHOD OF TEACHING

Sam H. Lane *+

The purpose of the present paper is to present a teaching technique, the "Continuous Feedback Method", and its rationale. This paper is a first statement of some developing ideas which should be considered as guidelines rather than a complete and proven model or theory. The technique is designed to approach several objectives that are difficult to achieve. The primary objective of the method is for students to increase general skills requisite to efficient coverage, integration and synthesis of written material. A corollary to the primary objective is that those students who increase their skills only at a minimal level still will have learned the content of the course as well as a student who has been exposed to the material in a more traditional manner. The primary objective probably does not differ a great deal from the primary objective that most teachers would set for their courses; but the Continuous Feedback Method does prescribe a somewhat different formula for its attainment.

The skills involved in the primary objective are strengthened through a shaping procedure in which the initial responses are simple approximations to the later, more complex responses. This gradual evolution of more accurate and complex responses follows certain principles of learning. There are three critical aspects of the shaping procedure: response production, the consequences of the response, and the time between the response and its consequences. The efficiency of the shaping procedure

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is increased by arranging for many responses, minimizing the time between a response and its consequence, reliably reinforcing those intermediate responses that are closer approximations to the desired response, and omitting reinforcements (or, in fact, punishing) for intermediate responses that are not closer to the desired response.

These aspects of the shaping procedure are germane to the general problem of getting students to learn in a classroom situation. In most courses taught in a traditional manner (especially in large classes), the rate of response production is equal to the number of quizzes and papers assigned in the course. In such a case, both the low rate of response production and the substantial delay in the receipt of the consequence by the student have a debilitating effect on learning. A "response", in terms of a student listening to a lecture and taking notes, is assumed to be qualitatively different from the response made when information is requested for immediate evaluation by the professor; neither does it have the same effect on subsequent behavior. In the former case, the process of information storage is primarily involved whereas the latter case involves information storage, retrieval, organization, production, and reorganization based on feedback.

The first step in increasing the efficiency of the shaping procedure described earlier is to increase the rate of response production. The major difficulty with increasing the rate of response in most courses is that a student's motivational level is usually a function of his interaction with the grading system. In other words, most students have been conditioned to do things because they are going to get a grade for it.

Therefore, at least initially, their rate of response production will be a direct function of the probability that their grade will be affected by what they do.

Using the Continuous Feedback Method both the rate of response production and the motivational level are kept at a level appreciably higher than it would be using most other approaches. The students are told that there will be no written tests and no papers. Their grade will be assigned solely on the professor's cumulative evaluation of their day-to-day performance, thus a high level of class attendance is required. Class time is spent discussing and answering questions about the material. Thus, during any one class, each student makes one, if not several, responses that he knows will go toward his overall evaluation. The high rate of response production is accompanied by the immediate application of a consequence relevant to that response. Since he does not know in advance exactly for which material he is going to be held accountable, he must "know" the entire assignment.

To some extent, what has been described thus far is similar to the "case method" frequently used in law schools. The Continuous Feedback Method, however, is designed primarily for use in classes with an enrollment of 30 or less. The case method is generally used in large classes so the rate of response production is rather low, even though somewhat similar motivational factors are present and the time between the response and its consequence is minimal. Another difference is that the Continuous Feedback Method is based on the notion that attaining integration involves a complex shaping procedure: initially responses are only simple approximations to the more complex desired behavior. The initial unsophisticated and later maturer responses are qualitatively only minimally different using the case method.

From my experience, I have identified roughly three sequential phases that most students go through in the shaping procedure. The first phase consists of two complementary components: establishing a high level of response production and developing personal strategies for recalling specific aspects of written material. A high level of response production is shaped by positively reinforcing daily class preparation and mildly punishing a lack of it. Class time is spent shaping the recall of rather specific and detailed pieces of information. This is the first approximation to the more complex responses involved in efficient coverage, integration and synthesis.

At first, the students are somewhat confused. They feel that "they have to memorize everything in the book". This feeling, coupled with the necessity for daily class preparation, leads most students to design personal strategies for remembering what they have read. Some class time is spent in going over aspects of remembering and forgetting and discussing possible strategies. Students are encouraged to share personally successful strategies with the class.

The second phase toward realizing the primary objective of efficient coverage, integration and synthesis involves identifying and assimilating relationships between various bits of specific information. Retention is not such a great problem any more, even though it still requires a considerable amount of practice. In this phase, it is not sufficient merely to recall specific pieces of information as was initially the case. Positive reinforcement is received only for using the specific information to identify relationships. Substantial communication among class members is encouraged at this point in order to allow the students to practice in a more relaxed perspective. These discussions usually foster a substantial amount of student-to-student shaping. In addition, they provide a diversion from the question-and-answer format.

At this point students find that material can be discussed cogently in the class group because they are sure that the material has been read by everyone in the class. The efficiency of the discussions is enhanced by emphasizing the distinction between clarification and evaluation of what he said.

In the third phase, the class discussions and questions are designed to shape the student's involvement with larger "chunks" of information, optimally relating the material in a chapter as a whole to previous material. Also, the student is encouraged to respond to questions with full answers involving examples that not only directly answer the questions but also show that he has a relatively complete understanding of the issues involved. A demonstration of these things is indicative that the student has achieved the primary objective of the method.

The shaping procedure described above will not work unless some attention is devoted to group maintenance. In particular, the level of anxiety for individuals as well as the over-all level of tension must be monitored closely. At a high level, individual response production is reduced and there is a general air of inhibition induced by anxiety.

There are several aspects of the design of the class which are addressed to this point. Throughout the first weeks an instructor should emphasize the proper perspective for the course is that of a game of information and that any punitive feedback should not be perceived as personal but should be considered as part of the instruction. To some extent, this idea is made more credible as students see that everyone in the class receives such feedback from time to time.

An effort is made to keep the class atmosphere as casual and informal as possible without confusing this casualness with attitudes toward the material. On the first day of class a simple child's exercise called "the name game" is played to acquaint the students with one another and to provide a vehicle for the professor to know everyone's name in the class very quickly. In this game the first person will say his name (first name only) followed by the second person repeating the first person's name and then saying his own. This goes on around the room until the last person calls everyone in the room by name and then says his own name. Usually this is followed by a hue and cry for the professor to do likewise, which perhaps surprisingly, is easier than it may sound, even for the worst "name-forgetter".

The professor must be attentive to the progress of individual students. If a student perceives himself as doing poorly he will sometime withdraw and become isolated. This indicates that one or more of the shaping parameters have not been effective. Usually the problem is that the distance between the approximating responses is too great. Withholding a positive reinforcement or administering a mild punishment to the response eventually results in response inhibition. In most cases a personal conference with the student which sets up some individual shaping schedules solves the problem. A personal conference is also appropriate when the shaping procedure precipitates an extraordinary amount of aggressiveness in a student and he fights too much. The students have to believe that the professor is not "out to get them".

As noted earlier, the students are told on the first day that their grade will be based solely on the subjective evaluation by the professor of their day-to-day performance. They are also told that if they do high quality work from day to day they will receive a grade of "A" (on an A, B, C, D, F grading system). If they just keep up they will receive a grade of "B" and if they don't they will get a grade of "C" or lower. Students, whose pattern of attendance and preparation suggest that they are not keeping up, usually drop the course of their own volition. In those cases when a student appears to be on the borderline between "C" and "D" work, he is counseled to that effect approximately two-thirds of the way through the course, thus giving him ample opportunity to bring his grade up.

The greatest cause of negative arousal on the part of the student is receiving a grade that is contrary to his expectations. This probability is reduced by the day-to-day feedback that the student obtains. Over the course of the quarter, the professor's standards become explicit, thus reducing one source of potential confusion. Also, there appears to be a subtle shift from responses controlled by the extrinsic motivation of a grade to responses controlled by a combination of intrinsic motivation and extrinsic motivation related to a social norm established by a close peer group of an individual "doing well", regardless of the grade he receives. Several other precautionary steps are taken. Half-way through the course a written statement is given to each student appraising him of his progress thus far and the grade he would receive were it the end of the course. Also, at the end of the course, each student anonymously gives each other student the grade he thinks the student would receive. This provides additional information to the professor regarding the general expectancies of the class of overall and individual performance.

With such a subjective grading system, there is always the possibility that a student will feel that he has been treated unjustly. The ratings by his class members can serve to validate the professor's assignment of grade. As an additional step to prevent this from occurring, the students are told on the last day of class that if they disagree with their posted grade that anytime within a 3-day period after it is posted, they may take a comprehensive written examination to demonstrate their level of competency. It is explained that if they really have been keeping up (in the case of an argument for a "B") or keeping up and doing high quality work (in the case of an argument for an "A") they should be able to reflect that level of ability on the exam with little need for much advance preparation. Thus far, no one has asked.

The strategy by which a professor makes decisions about the assignment of grades in such a system is an individual matter. I have found it useful to define initially the "A" category by the best student in the class and keep adding students until the differences between the most recently added student and the best student are too great to warrant the classification.

The effectiveness of the Continuous Feedback Method can be evaluated from several different standpoints. Generally positive student reaction, as indexed by both formal course evaluation forms and informal essays, may be summed up as follows: (1) this was the first course they had had in which they had to prepare each day and they found the experience both demanding and stimulating; (2) they had to work harder in this course than in other courses; (3) it was one of the few courses in which they felt that the professor was interacting with them personally; and (4) they felt that they learned more with this method than with a more traditional method. Negative reactions generally have taken the form of criticisms of aspects of the shaping procedure which were particularly crude during that particular quarter but were modified based on the feedback, or reactions reflecting consequences of not monitoring the level of individual anxiety and group tension. Valid objective data regarding the "amount" that a student learns in any course are always difficult to obtain. With the Continuous Feedback Method the most encouraging data would show that students coming out of this course did better in later courses than a matched sample who had not had the course. Thus far, obtaining such data has not been feasible. It can be argued, however, that an individual is learning more, both in terms of skills and content, in a situation in which he is making many motivated responses and obtaining differential feedback than in a situation in which he is making few motivated responses and obtaining limited feedback.

I have used the method in courses ranging from the sophomore through graduate levels of training and I have found that students from the junior level on seem to be able to derive the greatest benefit from it. The method seems to be appropriate for most areas of content. The technique makes rather strong demands upon the teacher as well as the students. He must be relatively "up" for each class and be very attentive to the day-to-day dynamics of the group. He must be prepared to be flexible and adjust the technique to his own particular style of interacting with students. In return, I think that he will find himself experiencing an exhilarating pedagogical experience!

THIRD FORCE EDUCATION: A COURSE IN PERSONAL GROWTH AND DEVELOPMENT

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It has been said that we live in a 'sick society' and that terms such as the psychopathology of the average, normal neurosis, and philosophical neurosis can be applied to a large segment of the population. Most of us are only too familiar with the myriad problems which besiege us, threatening directly and indirectly from all sides. Daily the mass media present vivid accounts of war, crime, pollution, and many other societal problems. We are less aware, however, of the psychological effects which these have on all of us. Modern man has been described by some of the most eminent psychologists and psychotherapists of our time as dehumanized, alienated, insecure, anxious, lonely, conforming, and not very happy. The picture, to be sure, is depressing.

Theoretically, the powerful and established educational institution could have a tremendous influence on the solution of many of these problems. Unfortunately, however, the ills of society also appear throughout most of education. The story is summed up succinctly by Abraham Maslow (1968b) who asserted, "Our conventional education looks mighty sick", but it is told in disheartening detail in books such as Silberman's _Crisis in the Classroom: The Remaking of American Education_, Taylor's _Students Without Teachers: The Crisis in the University_, _Goodman's Compulsory Mis-Education_

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In an atmosphere which is too often impersonal, threatening, and growth-inhibiting, our country's valuable young resources are exposed to a fragmented education which is frequently irrelevant and meaningless to them. In an educational setting which promotes values such as success, competition and consumption, our students are being molded in assembly-line fashion to be well-disciplined robots who defer appropriately to authority and conform voicelessly to the establishment. In classes which focus almost exclusively upon intellectual-cognitive development, our students acquire the abilities to memorize and recall so that only a part of the individual, his head, is prepared for only a part of his life, his job, or career, while his personal-social-emotional development is woefully neglected.

The recent development of third force education (Goble, 1971), in conjunction with humanistic psychology, the human potential movement, and laboratory training, represents one very important step towards improving the current educational situation. By providing a new philosophy, a new psychology, and a new methodology, these areas offer solutions to many of the problems we have just described. They provide the atmosphere and the ingredients necessary for an effective, well-founded education which meets the needs of the individual and contemporary society. Moreover, they provide the opportunity for the individual to develop psychologically so he can actualize more of his unused potential and lead a happier, more meaningful life.

Third force proponents point out that education can be "ecstasy" when relevant and meaningful materials arouse curiosity to high levels of excitement, when the student is free to learn in the more ideal atmosphere of trust, affection, and mutual respect, and when he is an integral part of a learning community facilitated by an authentic teacher. That same education can accentuate individual expression, expanded awareness, the dignity of man, and fulfillment of individual potential. It can facilitate human interaction by emphasizing values such as cooperation, deep encounter, and brotherly love. By stressing personal-social-emotional development, it can help him learn some of the most important things in life--how to love, feel, sense, be spontaneous, be happy, develop his identity, relate to his fellow man, and live life more fully.

To reach these objectives, third force education strongly emphasizes training in several specific areas: personal growth, interpersonal relations, group dynamics, and organizational development. Thus, Egan (1970, p. 13) comments, "Human relations training is perhaps the most important kind of learning but it is the most neglected. Perhaps it is presumed that such learning occurs naturally outside of the classroom. Most often, it does not; therefore, the majority of persons reach adulthood without being self-actualized in an interpersonal area." The importance of such learning is also stressed by Peterman (1972) who suggests that we build interpersonal skills training programs into our educational system.

Currently these training programs and courses are beginning to appear as part of a new ideology which is attempting to promote psychological growth directly through educational courses (Alschuler, 1969). Clark (1971) observes that the techniques of the human-growth potential movement have begun to appear in schools all over the country. In particular, there has been a remarkable increase in intensive small groups on our college campuses (Shaevitz and Barr, 1972).

An integral part of many training programs and courses is the laboratory training group, a powerful and effective methodology (Bühler and Allen, 1972) which is ideally suited to the goals of third force education. Rogers (1970) has called the encounter group, one of many different kinds of laboratory training groups, the most potent social invention of the century. It is suggested by Shepard (1970) that personal growth labs can function as a resocializing institution to unlock our mechanistic culture and help build a better society. Morris et. al. (1970, p. 192) assert that the T-group "fairly explodes with antidotes for what ails higher education," and Thomas (1964) makes the point that the group experience can facilitate the growth of the individual towards self-actualization.

Utilizing the encounter group methodology we have designed during the past year a course entitled "Personal Growth and Development," the primary objective of which is the personal-social-emotional growth of the student. Our purpose here is to describe the anatomy of this course in order to provide general information to some readers and more specific information to others who have already developed or who may be developing a similar course of their own. We shall also suggest several applications of this methodology to other educational situations.

The Personal Growth and Development Course

We might preview our later discussion by presenting a capsule summary of the course:

Psychology 467, Personal Growth and Development, is a course which focuses upon the interpersonal and intrapersonal growth of the student. This growth is based on experiential learning derived from participation in an encounter group which is enhanced considerably by extensive cognitive learning. The encounter groups meet in weekly four-hour evening sessions and for two three-day weekends during the quarter. Didactic sessions, both lectures and discussions, are scheduled during regular class time twice a week. Input to the professor is required through individual reaction papers, to group sessions, application assignments, task group assignments, and periodic questionnaires. Within this format, students have every opportunity to fully know and understand their experiences, the result of which is greater learning, longer retention, and more effective transfer of the general principles to everyday life situations.

The encounter group methodology

An encounter group is a small group of individuals (usually 8 to 18) who meet with one or two "leaders." Utilizing basic processes of self-disclosure, feedback, and expression of feelings, members of the group interact personally in the here and now to learn experientially. The groups are usually unstructured: there are no predetermined goals, no pre-programmed direction, and no leadership in the traditional sense.

Rather, the group members provide the data and resources for learning as they come to assume responsibility for themselves and the group as a whole. In the context of a psychologically safe environment, various personal and interpersonal issues arise from which each person can grow as he explores himself, makes decisions about desired changes, and subsequently experiments with new behavior.

Principles of program design

The design of the course is based on a number of important principles which are beginning to appear throughout the rapidly increasing literature in the field of laboratory training. Extracted mostly from research studies, theoretical articles, and papers which criticize laboratory training, these principles provide major themes which appear repeatedly in the different facets of course design. Some of these have general application to most laboratory training programs; others are specific to this course, representing idiosyncratic preferences rather than indispensable requirements.

Briefly, and succinctly stated, they are as follows: (1) The program is conducted by qualified leaders. (2) Applicants are carefully screened before being admitted to the course. (3) A psychologically safe environment is evolved as the context in which personal growth occurs. (4) As far as is possible, the methods used are supported by knowledge, theory, and research in the field. (5) The experiential learning is supplemented and greatly enhanced by a considerable amount of cognitive learning. (6) Learning and personal growth are heavily stressed. (7) There is a strong emphasis on transfer of learning to everyday life situations. (8) An optimal, but minimal, amount of structure is utilized to facilitate group development and maximize personal learning. (9) Exercises are employed in an appropriate manner. (10) The program is long enough to enable students to acquire a substantial amount of learning and to work through any issues which arise. (11) The program has built-in methods of obtaining feedback from students about the course as a whole, specific aspects of the course, and the leaders. (12) The course is associated with an on-going research program.

Course objectives

As in most laboratory training programs, the range of objectives and personal growth goals in this course is extremely broad and includes many different facets of human experiencing. Generally, however, we can divide these into two categories, interpersonal growth goals and intrapersonal growth goals. Interpersonal growth refers to those learnings which are concerned with interpersonal relations and which are derived primarily from interaction with others. Intrapersonal growth refers to those learnings which focus on the individual himself and which are acquired predominantly by his working alone on himself.

One set of interpersonal growth goals can be found in the work of Egan (1970) who provides an excellent description of what we call "specific behavioral skills:" listening, self-disclosing, expressing feelings, giving and receiving feedback, giving and receiving confrontation, and giving support. Another set of interpersonal goals consists of those which are pursued in most laboratory training groups: learning about group dynamics and group processes; developing sensitivity to others; learning to function effectively as a group member; learning about personal communication problems; learning how to communicate clearly; developing deeper, more meaningful relationships with others; relating to authority figures; relating to the opposite sex; learning to enjoy people and social interaction more; developing acceptance of others, empathetic understanding, and "brotherly like;" and acquiring knowledge about people in general.

The major intrapersonal growth goals are based on Maslow's (1968a, 1970, 1971) conceptualizations of mental health, human motivation and psychological growth. They include the general process of self-actualization and more specifically the many characteristics of the self-actualized person. Overlapping somewhat with these are other goals which are stressed in many laboratory training groups: developing self-awareness, self-insight; acquiring greater self-knowledge (about facades, defenses, personal problems, weaknesses, strengths, goals, values, and potential); developing self-confidence, self-esteem, and self-love; developing a stronger sense of identity; becoming more aware of one's real self; developing greater authenticity; developing sensitivity to oneself (senses, body, feelings, thoughts); and learning to experience, recognize, label, and express feelings.

These different sets of personal growth goals are presented explicitly to the student in several ways: in the detailed course description which he reads before applying for admission, in the Laboratory Training and Personal Growth Manual, and in the pre-questionnaire which he fills out at the beginning of the course. Thus, the student is well informed about the nature of the program prior to registering and aware of the potential range of goals which he might pursue later when the course begins. Through this kind of structure and goal visibility, wasteful and inefficient design is eliminated, thereby facilitating the learning process (Egan, 1970).

However, unlike the goals in traditional academic classrooms, the goals in a laboratory training group are not the same for all students nor are various educational activities pre-programmed to work towards these goals. Each individual has the responsibility of freely choosing according to his own needs and interests the goals he would like to pursue. Moreover, most group sessions are not pre-planned: what occurs is determined by the particular collection of unique individuals who compose the group and the free-flowing dynamics of human interaction.

Leadership style

The leadership style employed by the trainer strongly influences the quality of the experience for the participant. In what is probably the best series of studies available on encounter groups today, Lieberman (1972) demonstrates quite clearly the differential effectiveness of various trainer styles. Some produce a high degree of learning and growth, some result in very little learning, and others may be associated with negative outcomes and psychological casualties. Since these styles vary tremendously from person to person, both between and within training methodologies, it is important to present, in any program description, information on the particular style used.

In these groups the trainer functions in four ways. As a leader-member whose job it is to serve the group, he "guides" the group when necessary to facilitate group development and personal growth. More specifically, this function is that of a social engineer. As a valuable group resource, he draws from his wealth of knowledge, experience, and skill to provide the group, both voluntarily and upon request, with information, insight, and interpretation. As a model, he provides one example of an array of different behaviors which group members may wish to develop. As a member of the group, he is an individual who shares himself personally with others (although there are certain limitations to this).

The four dimensions of leader behavior presented in the Lieberman study provide another useful way to describe the leadership style. On the basis of trainer self-report, reports of other trainers and co-trainers, and participant ratings, the leadership style can be described as moderate on the emotional stimulation dimension, high in caring, high in meaning attribution, and moderate in executive functions. This profile describes the Type B leader, the Provider, who, Lieberman states, is "by far the most effective in producing positive changes while minimizing the number of participants who had negative outcomes" (1972, p. 160).

Screening procedures

Reports of casualties and negative outcomes have increased along with the increase in the number of laboratory training groups conducted. Examination of the literature in this area, however, reveals that the incidence of pathology is low when sponsors are reputable, competent organizations and the leaders are trained (Reddy, 1972). Since most laboratory training groups are intended for "normal" people with "normal" problems and not as quick or inexpensive therapy, it is desirable to utilize a screening process to deselect individuals who might be casualties or who might not otherwise benefit from the experience (Yalom and Lieberman, 1971).

Every student interested in taking the course is required to go through the screening procedures and obtain written permission before registering. To be reasonably well-informed about laboratory training groups in general and this course in particular, each student is asked to read a detailed course description and several short articles on groups. If he then wishes to be considered for the course, he is asked to fill out a two part application form. The first part is composed of short answer essay questions which inquire about his knowledge of encounter groups, expectations, personal goals, and previous psychiatric and medical history. A second questionnaire is designed to collect information about his environment, attitudes about himself and others, and behavior in interaction with others. When the questionnaire is returned and examined, the student is scheduled for a thirty-minute group interview during which time his behavior in a new group situation is observed. The final selection and deselection processes are based on a number of criteria which are just beginning to appear in the literature (Lakin, 1972; Reddy, 1972).

Group composition

From the twenty-four students admitted to the course, two groups of twelve persons, six males and six females, are formed. Within the limits of this sampling from a college population and in accord with what is thought to be a desirable group composition strategy, the groups are heterogeneously composed. Each group has a trainer (the professor) and either a co-trainer or student co-trainer. The co-trainers are students who have completed an intensive training program entitled Psychology 310-Leadership of Laboratory Training Groups. The student co-trainers are individuals who are participating in the training program and working with the course as a part of that training.

Course requirements

Experiential learning - the encounter group sessions

The major part of the course consists of participation in an encounter group which meets regularly throughout the quarter. In the schedule of group sessions which we have used most recently, students attend a four-hour evening session each week, a three-day weekend scheduled for the fourth week of the quarter, and a four-day weekend scheduled for the eighth week, thus totally approximately eighty hours in encounter group sessions. All evening sessions are conducted at the university in the group dynamics room where they are videotaped for the purposes of research, feedback to student co-trainers, and viewing by group members. The weekend sessions are held away from school in cabins which are rented at reasonable rates in nearby state parks.

Cognitive learning

In contrast with many other laboratory training programs which place an almost exclusive emphasis on experiencing, feeling, and sensing, this program strongly emphasizes the cognitive, as well as the experiential, aspect of learning. One of the most important determinants of learning outcome (Lieberman, 1972), the cognitive factor enables the student to know and to understand what he has experienced. By developing the ability to relate psychological knowledge to his experience and state behavioral principles, he can learn faster, retain longer, and later transfer these principles more effectively to everyday life situations. To attain these goals, we have designed the cognitive factor into the course in the following ways.

Reading materials

The course uses Egan's (1970) book Encounter: Group Processes for Interpersonal Growth, Stein's (1972) Effective Personality: A Humanistic Approach, and the Laboratory Training and Personal Growth Manual written by the professor. These present information which is directly related to the participant's experience in the groups on a wide variety of topics such as self-disclosure, feedback, confrontation, the learning process, and group development. Chapters are assigned whenever possible so that the information is immediately relevant to the students. For example, chapters on the goals of laboratory training groups are assigned at the beginning of the quarter and a chapter on transfer is read just after the first weekend session when the first transfer problems arise.

Lectures and discussions

In addition to the encounter group sessions the class meets twice a week for lectures and discussions. The primary purpose of this arrangement is to supplement the reading materials by presenting information which is not covered in the books. A number of these classes are devoted to task group discussions of group development and the transfer process, two important areas of the course.

Written assignments

To facilitate the student's understanding and further thinking about his experience, we ask him to write a "reaction paper" after every session. This consists of a structured questionnaire which focuses on the most important aspects of the learning experience. He is asked: (1) to describe the group events of the evening; (2) to give an account of his own participation in the group; (3) to state clearly and succinctly what he learned; (4) to indicate the most significant events of the session and their meaning to him; (5) to discuss any problems he is having; (6) to state his own goals for the coming sessions, weeks, or months; (7) to describe his plan of action for attaining those goals; and (8) to indicate how he will transfer his learnings to everyday life.

"Application assignments" are specifically designed to give the student a task in which he has to relate psychological knowledge and information directly to the group or himself. Done either individually or in a task group, these assignments focus on the topics of societal problems, group development, individual development in the group, the real self, and transfer. For example, on the vitally important transfer issue, students are asked to discuss the transfer process, different transfer situations, and the difficulties associated with it, and then to make suggestions for facilitating transfer. These they share with the rest of the class in seminar presentations.

At the end of the quarter, each student is asked to write a twenty-five to thirty-five page "personal-growth paper" in which he gives a detailed account of the evolution of his personal growth throughout the course. In essence, this assignment is a longer version of the individual reaction papers and covers the areas listed above.

Group development

The group development process can be divided into two stages. In the initial stage, which lasts about the first half of the quarter, the encounter group methodology is used to work towards the goals of group development and interpersonal growth. During this period learnings center mostly on the individual-within-the-group and group process. The second stage begins when the group has developed to the point where it functions effectively as a personal growth group, that is, a group whose major task is to facilitate the personal growth of its members. At this time, the interpersonal orientation is replaced by an emphasis on the individual and his intrapersonal growth. Since the groups develop in a manner quite similar to the account given by Rogers (1967), it seems unnecessary to present a description here.

Assessment of personal growth

The problem of what, when and how to measure outcome is an extremely difficult one in the area of laboratory training as it is in education and therapy (Lieberman _et al._, 1972). To begin with, the encounter group methodology and process are incredibly complex due to the wide range of potential goals, the intricate web of countless interactions, and the subjective nature of the experience. Secondly, good standardized measures of personal growth have not been developed yet, and pre-existing measures such as personality tests are not appropriate to the measurement task. Thirdly, the phenomenal nature of reports from participants, members of their social networks, and even group leaders invites criticism on several counts. However, in spite of these problems and others, this challenging task must be confronted.

To assess personal growth at the end of the course, we utilize information obtained through written assignments, observations, discussions, interviews, and questionnaires. The self-report is a very important source of information about the student and, therefore, is weighted quite heavily in the evaluation process. However, since questions about the validity of self-reports can be raised, the information from them is checked rather carefully against information provided by the leaders, non-participant observers, and other group members in an effort to increase accuracy.

The student's final grade for the course is based on two equally-weighted parts: cognitive learning, as represented by scores on the various written assignments, and experiential learning, as represented by personal growth derived from participation in the encounter groups. For the cognitive learning grade each reaction paper is given a weight of two, each application assignment is given a weight of three, and the personal-growth paper is given a weight of twenty. After the lowest reaction paper score is dropped, the remaining scores are averaged.

The experiential learning grade is based on the total amount of personal growth which a student displays during the quarter. Here we employ an extremely flexible definition of personal growth. This growth can be in any area of psychological development. It can be derived from any of a wide variety of sources beyond mere participation in the encounter group sessions (from interaction with one particular person in the class, from interaction with someone outside of the class, or from working alone). It can occur at any time during the quarter and in any place. The only requirement is that the student present to the professor, in one way or another, the information about his personal growth.

The information gathered from these different sources is then compared to the growth of other students inthe course, the growth of students who participated in previous groups, and the professor's subjective estimation of the amount of growth possible given the nature of the experience as it evolved during the quarter and knowledge of the specific individual. After all of this is considered carefully, the final experiential learning grade is assigned. In an evaluation session held at the end of the course, all of the collected information and the grades are presented to the entire group for comment and discussion.

Students' personal growth

Examination of information gathered from the many sources considered above suggests that most of the students profitted markedly by taking the course. Several fairly typical examples of students' personal growth are presented below in the form of excerpts from their personal growth papers.

My participation in Psychology 467 has been the catalyst of the most significant and valuable experiences of my life---the development of my identity as an individual and as a woman. I am learning to be what I am and not what I think others want me to be.

Who am I? I am a beautiful, unique woman cognizant of many new dimensions of her "real self"---positive as well as negative points, strengths as well as weaknesses, with real beliefs as well as direction. I am beginning to realize my potential and how to effectively channel it. I am learning to be "me" and accept responsibility for myself. I never really experienced "me" before because I felt I wasn't as worthwhile as I wanted to be. To avoid facing myself and risking rejection I managed to develop superficial relationships with myself and others via my defenses. The environment of trust and security provided by the encounter group experience gave me the jolt I needed to break down the defenses that were blocking my growth. I have developed more honesty and have confidence in myself. The inner security and warmth I have from self-acceptance has made me aware of what other people can give to me, and more importantly what I have to give others.

This positive support will enable me to continue to grow because my energy comes from within myself. Being intrinsically motivated is important because I have a long way to go to achieve my goals.

Through the experiences of the last three months I have become much more firmly established in myself. The beginnings of things such as confidence, self-love, self-acceptance, honesty, emotionality, sensitivity, empathy, and peacefulness which came into being this quarter have taken shape and form, solidifying into the congruent unity of my real self. I have come to feel strong and confident in my knowledge of myself, both positive and negative, and in my ability to express my feelings, needs, and values. I have found that I can look at myself objectively, seeing my faults and defenses and still accept and love myself. In doing this, I can give much more of myself to others. Also, as I have become more aware of myself, I have more fully realized ways in which I want and need to be interdependent with others while, at the same time, I am beginning to feel more free and independent, complete and whole in myself.

The levels of my sensory and emotional awareness have increased considerably. I am more sensitive to myself, to others, and to the world. I can now more fully appreciate nature and all the simple pleasures of my senses that I seldom noticed previously. This makes life invigorating and more exciting. Through my sensitivity to others, whole new channels of communication have been opened up to me.

I see my development in essentially three stages. Stage I was self-acceptance, acceptance of the group and appreciation of the fact that the members truly were concerned about my growth. Stage II involved going into myself and rediscovering who I am without my facades and defenses. Stage III followed, during which I have taken the insights continually provided by my Stage II activities and by interaction with the group and have transferred them to the outside world in terms of new behaviors. This is where the strength of the course lies for me.

My next step in personal growth was accepting people as individuals and understanding problems as they related to them rather than internalizing everything in terms of me. I found that I was being terifically shallow in all my relationships because I never really tried to understand or to reach out to others on their own terms. I was so into myself and my problems that I wasn't as sensitive, supportive or understanding as I believed I was. I realized that, fearing rejection, I had acted in a manner that brought about rejection. I began to really listen to others in the group and perceive what each member said as it related to him.

I am coming to have a great deal more trust in my own values and feelings, greater awareness of my psychological strength and independence, greater self-esteem and confidence, and deeper understanding of myself, my needs and motivations. In general, I feel more accurately aware of reality---the external reality of situations and relationships and the internal reality of myself.

Course evaluations

In order to evaluate the course and obtain information which might be helpful in improving its design, we ask that students answer anonymously a questionnaire at the end of each quarter. The first part of the questionnaire is composed of twenty-eight rating scales which focus on specific aspects of the course. The second part is a leader evaluation form which students complete for the trainer and the student co-trainers. Also, as a part of their personal growth papers, we ask the students to write out a summary of the entire course and what it means to them.

To give the reader information about student response, we briefly present here the results obtained from the students who enrolled in the course the first time it was offered. Students found the course extremely relevant and indicated that it penetrated deeply into themselves. They rated as extremely important both the course and the learning obtained from it. Personal involvement was high with most students spending a large percentage of their total academic time during the quarter on this course. In the words of one student, "The course was demanding. Anywhere from 65% to 75% of my time these last few months was spent in various class activities or related thought. However, when I consider the payoff, the significance to my life, this was little time and effort to spend for so much profit."

Not only did they indicate that they were highly motivated to grow personally, but, in fact, they did grow a great deal from both the experiential and the cognitive parts of the course. Most felt that they had developed a personal-growth orientation of considerable strength. The majority reported that the course significantly increased their enthusiasm towards many different aspects of their lives. Furthermore, they were highly motivated to transfer their learnings to everyday life.

The response to the cognitive part of the course was also quite positive. Students reported that they learned a great deal cognitively and that this very much increased the value of the encounter group experience. Moreover, they felt that the course stimulated their thinking in many different respects. In spite of the fact that there were no exams, they stated that they learned the cognitive materials better than in other courses and suggested that the policy of no examinations be continued.

In summary, then the students' overall evaluation of the course was highly positive. They gave it a "grade" of 94, considered it to be better than 84% of their other courses, and stated that they would recommend it to other students. Surprisingly few criticisms and suggestions for improvement were offered. Perhaps, the common positive response to the course can be captured in the words of one student who wrote, "If I were to think of life as a journey, then surely this course was the first real step of that journey for me. In every way it was the most worthwhile and the most meaningful period of my life, and hopefully, it will become more important as time goes on. I have never learned so much in such a short time, and never before has learning been of such great importance as the learning that took place in this course."

Applications

Training programs, laboratory training techniques, and courses such as the one we have just described have a wide range of applications throughout our educational system and especially in our universities. On the college level, schools such as the new University of Redlands have utilized group techniques to facilitate the development of the college community and as an integral part of the college design (Greening, 1971). On the departmental level, Boston College, as one example, made considerable use of the T-group in the evolution of a new graduate program in community social psychology; other departments employ group techniques in the interest of more effective intra-departmental communication. University counseling centers and psychological clinics offer various kinds of groups to the student body (Morris _et al._, 1970). Organizations such as student governments, fraternities, and sororities, and human relations groups, to name just a few, take advantage of the methodology to improve their particular organization. Some departments require their majors to enroll in certain courses or participate in certain training programs. Finally, there are courses in most universities to which students flock by the dozens.

Beyond these applications there are several others which we might explore here briefly. Training programs might be offered as a part of a large number of courses (social psychology, personality, humanistic psychology, etc.) to work towards certain objectives which are more effectively reached through the experiential learning process than by cognitive learning alone or to facilitate students' learning and application of the cognitive content of the course (Bales, 1970). For example, we have offered Growth labs, a shorter laboratory training program ranging from sixteen to fifty hours in groups, as one of many grade options in six different psychology courses over the last four years. Student response to these groups is almost always enthusiastic and many feel that they are the most important part of the course.

Application of these techniques, however, is not restricted to use in psychology courses; they can be used as an educational tool in just about any class. As an introduction to a course, the group experience enables students to get acquainted with each other and the professor and to become psychologically involved. Perhaps even more important, it helps to establish a more ideal learning atmosphere in the classroom community. Task groups develop more rapidly and function more productively if attention is paid to process concerns through the use of various group techniques. In particular, certain structured exercises work especially well in this restricted context.

We have also found that discussion groups can be facilitated so that they take on certain encounter group characteristics. After several meetings the students begin to interact more personally within the group and self-disclose at deeper levels. Gradually, they become more open to self-examination and more receptive to feedback from the group. The content of the discussion group then becomes much more meaningful and relevant as the individual applies it to himself. In addition, most students seem to enjoy the feeling of belonging to the cohesive group which develops.

Beyond these applications, we believe that courses such as this one and other related courses (Interpersonal Relations, Group Dynamics, etc.) should become a standard part of the college curriculum. With their emphasis on personal-social-emotional development they provide the badly needed opportunity for individuals to come to know themselves better, to develop psychologically, and to develop a host of communication skills. In doing so, they fill the void which currently exists in this area of a student's education and thus make more likely the education of the "whole" human being.

Final comment

This description of third force education and the small sample we have provided are optimistic to be sure. We should not lose track of the criticisms which this field must confront and answer as it develops, but we cannot help being hopeful about the contributions it can make to our troubled society. As Greening (1971, p. 102) writes, 'Still, if we are to reverse the endless saga of man's inhumanity to man, I believe that few social inventions can equal encounter groups as a method for enabling people to learn from their differences and discover or create their unity. When future books on existential and humanistic psychology are written, I predict such groups will be seen even more clearly as a major way in which man makes his own human nature.'

The picture can be a happy one.

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THE "ADVERSARY METHOD" OF TEACHING

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For twenty-five years I have used a method of teaching in law and other classes, which is my own "invention" and which I call "The Adversary Method". While this method was intended originally only for classes in law schools, I have used it with most satisfactory results in teaching other subjects (history, literature, military science and tactics) and other categories of students as well (such as undergraduate classes, and in continuing (adult) education courses).

The effectiveness of this method has won almost unanimous acclaim by students, who often describe it both informally and in formal evaluation surveys as the best and most interesting method they have ever seen. The method (probably as much as my own quality as a teacher) has won regular, year after year, evaluation by students and faculty and inspecting educators as a teaching technique second to none. This may sound immodest, but it is simple fact; no brag. I need only refer you to the records.

Parenthetically, I add that few great teachers have been demurely modest persons, while many poor ones have cloaked their inadequacies in the mantle of meek modesty. In fact there are few good teachers who are not also born ham actors like me. Indeed, the best teachers almost always are blazing "personalities", whose charisma, wit, charm and "bite" make their scholarship and ability seem far greater than they actually may be.

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Method really is a secondary matter to the best (born) teachers. But effective method can greatly assist even a born teacher; while it may save even an untalented plodder from failure.

Emulation of my method has been surprisingly rare, despite the fact that so many people have seen and praised it. My belief is that most people, quite erroneously, think that it is my scintillating personal teaching ability that makes the method work so well -- which, of course, means that most others (even fine teachers) avoid the method lest they look weak by comparison. In fact, quite a number of professors have told me just that. But the irony is that the method per se goes very far towards making success for those bold enough to try it.

Among the professors who now do use the method at least occasionally, are such top flight law professors as James K. Weeks of Syracuse University, Marcus Schoenfeld of Villanova University, James E. Brown of University of Missouri at Kansas City, Justin C. Smith of University of California, Hastings, and others. At Cleveland State University College of Law some professors very occasionally do use the method, but none (as far as I know) has truly adopted it as his or her main method.

Twice now I have written up the Adversary Method (1, 2). I have lectured on the subject at the invitation of faculty and students at Case Western Reserve University (about 1962) and other law schools, and to the League of Ohio Law Schools (about 1959). All in vain. Few teachers have had the courage and self-confidence to take advantage of the great advance in educational methodology which is the Adversary Method.

How the Method Works

Seriously, the Adversary Method is a natural expression of the case method of law teaching. In the bargain, it employs a number of other educational devices. Its chief drawback is that it demands from the instructor perhaps more work than any other method of law teaching. That small defect, I suspect, may be fatal to its wide adoption. It seeks to follow the normal practices of the case-hardened lawyer.

The instructor calls student Smith to be counsel for the plaintiff in the case, and student Jones to be counsel for the defendant. Both counsel stand, facing the class, with whatever notes and books they wish to use. They are to be advocates in the true sense of the term. By their contest, they are to winnow out the truth of a case.

The instructor then states the facts of the case. It is the instructor's task to reduce the complex story of a case report to terse essentials. All facts are simplified and stated in the present tense. It is assumed that the facts are familiar to the students, but even if the students have not read the case, they quickly can grasp the situation.

The first question is then put: What does Smith's party want? Then, what is Jones' man after? These are factual questions based on probable motives and normal human desires.

Next, the plaintiff must decide what kind of legal action he will bring, and for what kind of relief. The defendant's legal objectives also must be indicated. They must select the legal tools to achieve the objectives desired by their clients, as lawyers must do.

Now, the plaintiff must state his theory of action and outline his petition, succinctly, and in simple though formal terms. A certain minimum knowledge of practice and pleading suffices as the framework within which to couch the complaint. Complex procedural issues are avoided.

The defendant answers, by demurrer (stating the grounds therefor), by confession and avoidance (stating his grounds), or occasionally by denial (which merely postpones his duty to employ law rather than facts as his defensive argument).

As each step progresses, the instructor guides and clarifies the students' statements and presentations. Often, the student's statements are rephrased in order to make them more readily understandable and to improve their form.

Digressions, such as motions to make more definite and certain, or brief examinations before trial, rarely are necessary or desirable. The quality of the casebook employed obviates the need for much such explanatory maneuvering. Much depends on the simplification of facts done by the instructor. In spite of all these seeming procedural problems, there is, in fact, hardly any trouble with practice or procedure, even in first-year courses. The students' knowledge gained in an Introduction to Law Course seems to be adequate for the purposes of the adversary method. Only in the first three or four sessions need these procedural matters be carefully explained and corrected. Rudiments of procedure suffice. Yet, the inevitable need to interrelate substantive and adjective law becomes quickly apparent. Very soon, the students learn to use the simple procedural forms for stating their arguments. They quickly become accustomed to thinking in terms of both substantive and

and procedural aspects of a case.

Both sides having stated their cases in general terms, we then move to specific arguments. Thus, in a negligence case, the plaintiff cites the elements of negligence and then shows how his facts provide the elements, one by one. The defense then attacks the defective or missing elements, just as specifically. Or the defense indicates affirmative defenses. Issue is joined. Arguments are developed, with strong emphasis on syllogistic reasoning and presentation. Intuitive and emotional reasoning are sharply discouraged.

The two "attorneys" are allowed to expand upon their chief points for a few minutes. Then, the instructor renders the decision, summing up the pertinent reasoning and law. Throughout the process, the other students are encouraged to interject questions and pertinent comments. The entire class participates in each case.

Finally, both "counsel" are requested to express their personal opinions as to the validity of the decision, the principles and law applied, the possible dissenting opinions, and the legal philosophy that underlies this and other such cases. Others who wish to comment or ask questions are also free to do so. When all goes well, as it usually does, the discussion grows warm and must finally be cut off by the instructor in order to take another case.

The Instructor's View of the Method

In preparing to use the adversary method, the chief task of the instructor is to brief the cases in terms of "P" for plaintiff and "D" for defendant. Complex fact situations in the reports must be boiled down to a simple series of statements of what happened. Written briefs are almost indispensable to the instructor, for each case.

Study assignments include text material to be read first, then the cases and also commentary-type material such as Restatements, law review notes, and the like. The student must have a fair general idea of the law involved if he is to analyze the case well. In a sense, the cases often are illustrative material rather than raw material. Yet, by reversing the assignment method occasionally (e.g., assigning cases only), the student is trained to extract the law from the cases. Both approaches are used, not merely one of them. The modern "cases and materials" casebooks lend themselves beautifully to this method-which, after all, is the case method carried to its logical conclusion.

At the beginning of the semester, the instructor explains the method to the class. It is pointed out that this is a fine opportunity for each student to act like a lawyer at every session, or to make a blithering ass of himself. The chance to think on his feet appeals to almost every student, as does the chance to approximate the actual function of a lawyer in practice. All this makes for an interested class, with everyone participating at every session. Very often, in this method, the instructor feels that electric sense of communication that is the chief reward of a teacher's life.

Time after time, in every class without exception, I have been told by many students that they enjoy the adversary method. Very often, students have said, "This is the best method of instruction that I have ever seen." I repeat this with no sense of false modesty. What the student thinks of the instructors and of the methods of instruction seem to me to be vitally important. I do not hold with those instructors who say that the student does not know what is good for him.

This method enables the instructor to cover four to six cases, or more, quite thoroughly in an average two-hour session. By starting the session with a short summary lecture on the law to be treated before taking the cases, the cases are made easier. Sometimes the order is reversed; the cases are taken first, and then the session is ended with a short lecture-summary of the law.

Occasionally, the procedure is varied. A student is called on to state the facts, and then discussion is conducted in the method usual in most law school classes. This prevents students from coasting on the instructor's work. Yet, the adversary method itself quickly reveals the student who is unprepared. Natural intelligence and general knowledge may enable a student to perform weakly when unprepared, but not to perform well.

Socratic questioning by the instructor is applied often, but not invariably. From the instructor's viewpoint, the adversary method is eminently flexible and endlessly challenging to him as well as the students.

Subjects in Which the Method is Used

I began to experiment with the adversary method in 1947, owing to dissatisfaction with the dullness of student presentations of cases. Student interest was manifested at once. Since 1948, and in both day and evening law school classes, I have employed this method regularly with consistently satisfying results. The subjects in which it has been used range across the entire curriculum. Specifically, the subjects have included Torts, Corporations, Non-Profit Organizations, Creditors' Rights, Equity, Real Property, Bankruptcy, Corporate Reorganization, Business Organizations, Bailments, and Carriers, and Suretyship. I have used the adversary method at New York Law School and at Cleveland-Marshall Law School.

Originally, it had seemed to me that perhaps the method might have to be limited to naturalistic, equity-type courses, but now I am convinced that it can be used with profit in almost every course in the law schools. It is as interesting and provocative in a formal statutory course such as Bankruptcy or Corporations as in a common-law course such as Torts or Real Property, or in Equity. It lends itself as well to purely adjective subjects as to substantive law subjects. In brief, there seems to be no course in which it cannot be used to good advantage. It seems to impart interest to every course.

Analogous Methods

The problem method, used at some schools in the past few years, is somewhat analogous to the adversary method. The problem method, however, is based on written materials specially prepared for the purpose and is a much more formal technique. Moreover, it seems to be limited in its range of application, from the point of view of pedagogical utility. By no means does this suggest any derogation of the problem method. It is excellent, but is not the same thing as the adversary method at all.

Undoubtedly, there are others elsewhere who have used or are using methods analogous to the adversary method. But no one is using a method closely similar in detail, as far as I have been able to ascertain.

Conclusion

This note is intended to report briefly the results of many years of use of the adversary method in two law schools, in day and evening classes, and also in summer sessions. The results have been uniformly good. What began as an experiment, growing out of dissatisfaction with the usual dry student presentations of cases, has crystalized into a time-tested technique that has proved eminently satisfactory. In the bargain, the method has invariably maintained the enthusiasm of the students and kept the instructor keenly interested.

It is my considered opinion that the adversary method is no less than the best method of law school teaching that I ever have used, seen, or heard about. It demands much of the instructor and of the students, alike, but its rewards are great. I commend it to the attention of law teachers, again. For law teachers who want their classes to have spirit, direction, a sense of exploration, excellent (and visible) results, the fire of contest that inspires the true advocate, and the timeliness of living philosophy, I know of no better method.

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ACCELERATED LEARNING: AN EXPERIMENT IN THE APPLICATION OF SUGGESTOPEDIA

Marina Kurkov[*]

I. Introduction

(1) The Suggestopedic Method

An experiment in teaching Beginning Russian was carried out at The Cleveland State University in the Fall of 1971,[+] testing the applicability to an American curriculum of Lozanov's suggestopedic teaching method in which suggestive hypermnesia is induced, in an ordinary state of wakefulness, in the classroom (Lozanov, 1971).

(2) Students

The experimental section (Russian 121-2) consisted of fourteen students, with nineteen students in the control section (Russian 121-1). The arbitrary decision as to which section would be experimental was made before knowing anything about the enrollment. The nature of the experiment was explained to both sections during the first session. The students were offered a choice--to stay, change sections or make other adjustments.

In a community like Cleveland with many ethnic groups, classes are composed of students who speak/hear languages other than English at home. Some of these have studied the language at church school or at high school level. Those too advanced for the beginning level are placed in a higher level, determined by the MLA tests at the time of admission.

The students' records provided the following facts: in neither the experimental nor the control groups were there any students who spoke or heard Russian at home. However, 41.5% of the experimental and 50% of the control groups heard another Slavic language spoken at home. Of the experimental group 42.8% had had some previous formal training in Russian, while in the control group the corresponding percentage was 29.4%.

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Exposure to another language at home or abroad (a Slavic language especially) and the formal study of Russian are significant factors in a student's progress, although difficult to measure and evaluate. All the students from both groups had studied another language (with varied amount of success for different lengths of time). Aptitude for languages was not tested.

In order to determine whether a basic difference existed between the control and experimental groups, the same 60-item test was administered to the two groups when each arrived at a given point in the test. Had their basic abilities or knowledge been significantly different the test results would have reflected this. The tests, however, showed no significant difference between the results of the two groups. When two second-quarter Russian classes (taken from the mass-testing evaluation group of 1971) were tested at the end of twenty weeks, there was also, predictably, no significant difference between their levels of performance.

(3) Textbooks

Both the control and the experimental groups used Clark's Russian for Americans (Harper and Row, 1967). The book consists of twenty-eight lessons, preceded by four introductory lessons. These present the alphabet gradually, with the dialogues transcribed phonetically. The dialogues are recapitulated in Lessons 1-4 in the Cyrillic alphabet, while the grammar sections are expanded to include new material. The lessons contain grammatical explanations, dialogues, exercises, reading material, expression lists (10-20 per lesson) and vocabulary lists of approximately fifty words per lesson. Language tapes and workbooks are available.

(4) Schedules and Goals

The experimental class was scheduled to complete eighteen lessons in addition to the introductory A-D units in ten weeks (forty 50-minute sessions). The control group was to keep the pace set by previous

Beginning Russian classes: nine lessons in addition to the introductory series.

Roughly stated, the goal of the experimental class was to cover twice as much material as the control section in the same amount of time. An important concurrent goal of the experimental group was reading ability. An appraisal of the role of reading is given by Aronson (1970):

> In general, our first year courses emphasize either conversation or grammar (and usually achieve active command of grammar rather than passive). Reading, precisely because it is difficult, is often postponed to the second year course. It is all too often forgotten that the pattern drills of our audio-lingual courses and the grammar exercises of more traditional approaches are of no value unless they have generating power: i.e., they allow the student to generate (or decode) the greatest number and widest variety of utterances. . . . the real goal of the first two years must be reading ability and all that that implies, namely passive rather than active command of the grammar, more attention to the goal of passive comprehension than to that of speaking, and the relegation of writing ability to a very low position in the scale of desiderata.

Reading ability requires knowledge of vocabulary and the rudiments of grammar. The experimental students knew enough grammar at the end of the ten weeks to handle syntactic units, while their vocabulary corresponded to that of a student at the end of twenty weeks of study.

In addition to the vocabularies and expressions from the text book, the experimental group was given basic vocabulary lists (Josselson, 1953). A reasonable goal seemed to be a total of 695 words. Many of these words overlapped with the textbook vocabulary and were considered basic to students entering second year (fourth quarter) Russian. From Pushkin to Pasternak (Josselson and Parker, 1963), a widely used second year reader offers the following in the introduction:

> ...sampling of the vocabulary of the selections used in this reader, indicates that three-quarters of the words used belong to Lists I and II of The Russian Word Count. The remaining four lists account for about 15% of the vocabulary of the text, while about 10% of the words of the selections do not appear on the basic six lists.

It follows that after ten weeks of studying Russian by suggestopedic means the student could master more vocabulary than usual. This would enable him to read Russian with a minimum of dictionary-thumbing frustration. Reading, in its turn, is an effective vocabulary builder.

(5) Tests and Standards

A. The MLA-Cooperative Foreign Language Test

The MLA-Cooperative Foreign Language Test was developed to test the four basic language skills -- listening, reading, speaking and writing. Two levels of the test are used: The L level, aimed at the first and second year of secondary language and first year of college language, and the M level, for the 3rd and 4th year of high school and 2nd year of college level language. Each level is "barely appropriate" for the other, being either too easy or too difficult. (For greater detail of the statistical characteristics of these tests one is referred to the MLA Cooperative Language Tests, Handbook and the Booklet of Norms.

B. Administered Tests

Upon completing the sixth lesson in the textbook, (each group at a different time) the experimental and control groups were administered a test containing 60 units: 30 tested listening ability and 30 reading ability. The goal here was to determine whether these two groups differed in their general ability to deal with a given body of language material.

The experimental and control groups were tested at the MA-level of MLA of listening and reading tests at the end of the tenth week of instruction. At this point the experimental group had completed seventeen of the proposed eighteen lessons, while the control group had finished the nine lessons as planned. The purpose of the testing was to determine whether there was significant different between the scores of the two groups.

Both classes were periodically tested on short quizzes which ultimately helped to determine the students' grades. No comparison was attempted at this level.

C. MLA Series - The Rationale for Selection

The MA level, appropriate to the second-year college level was used rather than the LA level, appropriate for the first year. The reason for this was the fact that Cleveland State students placed higher on the MLA Russian language tests generally than the norms would lead one to expect. The need for such an adjustment had been foreseen by the developers of the series: "Interpretations based on the local norms may differ significantly from those based on the national norms."

If, contrary to expectation, the experimental group did not produce scores high enough for comparison with the existing MLA scores administered to more advanced students, a relevant correlation between the scores of the control group and the experimental group could still be made. Had the LA level been used for testing the two groups, there would be no possible upward comparison with the higher scores since for Russian the LA and MA scores are not convertible, and, as has been pointed out above, it is desirable to draw comparisons within local groups.

D. Omission of Writing and Speaking Tests

There were several reasons for the omission of the written and oral tests. While speaking and writing skills were not neglected in teaching the two groups, it seemed better to concentrate on the testing of listening and reading comprehension, since the answers can be treated objectively.

Also, in order to use earlier testing data from Cleveland State, we were limited to the above two tests.

E. Other Uses

It should be noted that the MLA scores were not used for evaluating students except to determine the validity of the experimental teaching method. However, in the light of the statement made by the Cleveland State Testing and Evaluating Committee, they could have been used. "Careful analysis of all the data suggests that the degree of correlation between MLA scores and class grades is very high, suggesting that, no matter what the sceptics think, the MLA tests do reflect adequately what we teach."

(6) Grades and Credit

Both the experimental and the control groups drew one-quarter of their grade from the midterm examination, one-quarter from the final examination and one-half from the daily work -- quizzes, written assignments, classroom recitation, laboratory progress, effort, attitude, etc. The reason for placing greater value on daily work was to discourage cramming for both groups and to assure "copying" of the vocabularies for the experimental group.

Members of the control group, upon successful completion of the ten-week course, gained 4 hours of credit. Those in the experimental group, having passed their midterm examination (which was equivalent to the control group's final examination), obtained credit and grades for ten weeks of Russian. The subsequent five weeks gave them an additional four hours of credit. The average grade for the control group was 2.5 (C) and for the experimental group (for the total of 8 hours) a 3.0 (B).

II. Classroom Procedures

(1) The Control Section: Russian 121-1

With the control group the teaching method was eclectic. Before the students had mastered the alphabet, the emphasis was on aural-oral works on classroom repetition and the outside use of tapes. Exercises in the laboratory manual were periodically checked, although attendance was outside of classroom hours and not mandatory.

Grammar was assigned to be read but was explained in class only as the need arose. The hour was mostly devoted to exercises and drills, and later in the quarter, reading and elementary conversation.

Both classes were aware of the existence of the other. From beginning to end the control group could be characterized as a typical Beginning Russian class.

(2) The Experimental Section: Russian 121-2

The experimental group met in a faculty conference room which contained conference-type tables, padded chairs and a blackboard. There were no outside windows and distraction was minimal since the conference room was surrounded by offices rather than classrooms.

The students were told initially that in their experimental section a modified version of Lozanov's method would be employed. It was called "accelerated learning" in order to avoid any undesirable connotations which "suggestopedia" might have.

The class was informed that this method was successfully used in Bulgaria, East Germany, Russia and India. The method, it was explained, did not involve hypnosis or sleep learning and was obviously not "total immersion". It entailed their relaxing while listening to a taped concert, during which the instructor would read language materials. They were to listen to the music, not the instructor.

In preparation for the passive, concert session they would need to copy vocabulary lists from Russian to English and vice versa.

The active part of the hour included reading, reciting dialogues, clarifying grammatical problems and taking quizzes. A modification of the method, justified by the brevity of the active session, lay in the use of a native speaker in place of the tapes. The instructor and an assistant were available for one hour a week to practice pronunciation with the students. It was essentially the same arrangement that the control group had in the sense that attendance was not mandatory. An advantage lay in having pronunciation instantly corrected.

This variable would be expected to have most influence on the pronunciation of students, and although students from both groups made tapes in the course of their study, the laboratory versus native-speaker element was not studied.

No special training in relaxation was given to the students, other than the recommendation that deep, rhythmic breathing would facilitate relaxation. Some cradled their heads in their arms; others slid into semi-prone position in their chairs. Most kept their eyes closed during the passive session, during which lights were dimmed.

Initially, the passive sessions were brief: the dialogue would be read from English to Russian and from Russian to English. Then relaxation would be interrupted and students asked to repeat phrases after the instructor. Subsequently, as the students learned the alphabet and could prepare for the passive sessions by copying the vocabularies, the passive sessions were extended up to 30-35 minutes, with a 15-20 minute active session. Students expressed their preference for longer passive sessions, noting that the relaxed state became deeper during a prolonged passive session.

The vocabulary quizzes, while consuming much of the active session, were given for each lesson. The majority of these quizzes were Russian word or phrase lists for which the student would supply the English equivalent. While the quizzes were graded in terms of percentage correct, this was not a part of the daily grade. Diligence in copying was graded.

Students could view their quizzes, but were not encouraged to do so. Instead, they were told their percentage and were each given a list of words which they should review (words they had missed).

The grammar section in each lesson was assigned as outside reading. They were asked to check the appendix in order to see the segment of grammar being studied as a part of the total scheme. Problems and questions were dealt with during the active session.

The experimental group appeared to be less lively than the control group--perhaps due to the passive session, the more sedate surroundings, or the earlier hour. (The experimental group met at 9:00 a.m.; the control at 11:00 a.m.) The student-instructor rapport was not as well developed as with the control section, due possibly to the lesser active-contact time.

III. Evaluation

(1) Comparative Data

Below, reference is made to four classes: the two Beginning Russian classes (the experimental and the control groups, Russian 121-2 and Russian 122-1, respectively) and fifth and sixth quarter Russian classes

(Russian 125 and Russian 201), which were selected for comparison because they were of the same local groups as the above, and because the MLA test data were already available.

When the MLA examination scores for these four groups were processed by computer, it was shown that there was a significant difference between the scores of the experimental and control groups at the end of ten weeks of study. There was a significant difference between the achievements of the control group and the experimental group (at ten weeks) and fifth and sixth quarter Russian classes (at fiftieth and sixtieth weeks).

The results of the 60-item test, similarly processed showed no significant difference between the scores of the control and experimental groups. This would seem to indicate that there was no basic difference in the learning capabilities of the two groups.

Students from the experimental group having received credit for Russian 121 and Russian 122 (8 hours) at the end of ten weeks, continued their study by merging with a class which had achieved its third quarter status by regular means. This merged 123 class, consisting of experimental and regular groups, proceeded to study Russian by intensive reading, supplementing this with language analysis exercises, written compositions and toward the end of the quarter, oral reports. The 123 program was somewhat ambitious in that a second-year reader was used. More than half was covered, although one third of the book is considered sufficient for a ten-week session, beginning with the 124 level.

The suggestopedic method was not practiced, although some of the experimental group students inquired about continuing vocabulary study by means of suggestopedic tapes. This was not done, although one student persisted in "copying" vocabularies.

The overall grade comparison of the experimental and regular components of Russian 123 seem to point to an integration of the two groups, in as far as grades were concerned. Initially, there was social polarization between these two segments. Toward the end of the course, however, the groups were well integrated.

(2) Conclusion

In evaluating the suggestopedic method, Lozanov (1971) writes: "The suggestopedic memorization session is decidedly a new element in the process of education. Its goal is to assure memorization of the program presented, which, due to the suggestopedic conditions, is significantly greater than the usual for the capability of human memory. With some experiments the material which is presented for memorization may attain fantastic proportions."

In this experimental application of suggestology, the first ever at an American university, the results were favorable; the accomplishment of twenty weeks' work in ten weeks was considered encouraging, although one cannot with certainty isolate the responsible variables. The experimental students were shown to assimilate well into a group which had studied by regular means. The grades of the experimental group in Russian 123 were satisfactory. In 124, while no longer under direct observation, each experimental student was seen to perform according to his own interest and capacity. The early learning spurt during suggestopedic training, was followed by more standard development.

It is to be hoped that further studies of suggestology in America would seek to broaden general knowledge in this area rather than repeat what has already been demonstrated in Bulgaria. Regarding application of the method, it should be stressed that for practical application, an internship is not only recommended, but essential.

(3) Comments

It is interesting to consider some of the theoretical aspects of the suggestopedic method and to examine the means and degree of their incorporation into the teaching experiment at Cleveland State University.

A. Authority

Authority plays an important--if not decisive--role in obtaining good results with suggestopedia. According to Lozanov (1971), it is "one of the basic elements in suggestopedic methodology". In a way, two other key elements "infantilization" and "intonation" depend on authority.

Taking into consideration that the average American student does not stand in awe of his teacher as much (if at all) as his European counterpart, the effectiveness of suggestopedia might appear to be in doubt. However, there are many forms of authority which would seem to dispel that doubt. Lozanov lists the authority of personality, dogma, faith, common sense (logic), experience, a good artisan, teacher, doctor, parent, the majority, the collective.

The instructor's self-evaluation in terms of authority (medium minus to low plus)--based on the attitude of "let us learn" rather than "let me teach you"--was probably compensated for by the authority of the institution where the experiment was conducted; the authority of the instructor's belief in success of the project; the authority of the majority (none of the original students switched to the control group when given the chance to do so). Equally important and quite apparent was the authority of experience which was demonstrated in the quiz scores.

B. Infantilization

Lozanov's concept of infantilization is not Freudian, as he points out, nor does it entail regression, being a selective process in which the malleable qualities of early childhood, such as trust, serenity and acceptance predominate. Normal intellectual activity is not impaired.

When the means for achieving this are suggested, it is not difficult to see "infantilization" developing in the experimental class: pseudopassivity (i.e relaxation), a serene atmosphere generated by the dim lights, music; role playing (as in acting out dialogues); and the inevitable name change (even if the Russian equivalent is not given, an American name pronounced with a Russian accent is different.)

C. Intonation

The role of intonation in suggestopedia appears to be subsidiary, a means for conveying a stream of signals to the student. Thus, a "declarative tone", a "quiet tone, full of significance", "a powerful, sure, hard, final tone"--all are used to establish authority. And although Lozanov examines the part played by intonation in great detail (including intonograms) he finally deemed it to be unnecessary.

D. Rhythm

Experiments with rhythm have shown that with suggestopedia, a ten-second interval between utterances gives a statistically significant positive result. This rules out the contention that simple repetition is responsible for the result (with 1-second, and 5-second intervals it proved insignificant). In the experimental class at Cleveland State, it was not possible to have the 10-second pause, due to the brevity of the session.

E. Concert Pseudopassivity

Concert pseudopassivity is defined by Lozanov as the deep relaxation which occurs during the passive session. It is beneficial but only insofar as it leads to a suggestible state. Calm and trust prevail, and no intellectual effort is made to recall or analyze. Thus, the anti-suggestive barriers are overcome and various mechanisms discussed above are activated.

Not having measured the degree and quality of relaxation experienced by students during the passive session by recording the bioelectric activity of the brain, there is only the student's own assessment of the quality and degree of his relaxation. Of the polled group, 41.5% "sometimes relaxed", while 24.9% always relaxed, with an 8.3% concentrating on the instructor.

F. General Remarks

It would appear, judging from the student evaluation, that, on the whole, they were in favor of the method, although many felt that they needed to spend more time than usual in outside preparation, such as vocabulary copying and reading grammar.

The assignments, from the instructor's point of view were the same length as other Beginning Russian assignments.

Approximately one-half of the students thought that they could have accomplished as much without this method, while one-third thought they could not. More than one-half estimated that they could have done as well if no grades were involved, while the one-third assumed that it was better to have the incentive of grades.

Over one-half of the experimental group were satisfied with their accomplishments, 8.6% were dissatisfied, while the remainder had specific recommendations instead--such as: "We went too fast", "Most relaxing class", "I should have copied more consistently", "We should have spent less time on easy lessons, more on the hard", "Longer passive sessions".

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NECESSITY FOR DEFINING OBJECTIVES IN COURSE DESIGN

Jack A. Soules*

You have all gathered here today to hear a discussion of educational objectives in course design. I owe you an apology. At the time this talk was scheduled, that seemed like a proper topic for early March. In fact, however, this audience has enjoyed several presentations on that subject, all of which were better than anything I could hope to do. So, with the permission of your program chairman, I have prepared my remarks today on a related but somewhat different topic. I am going to depart from general principles and avoid offering a sermonette on good teaching. Instead, I am going to describe some small examples of clever teaching that have been successful for me. They are obviously selected; out of the dozens of things I've tried--most of which weren't very successful--I've chosen a handful that gave me a great deal of satisfaction and a strong feeling of success. Besides, my students liked these tricks and methods and responded favorably to them, which may be why I enjoyed them too. So let's change the title of this talk to: Examples of some ways to make ordinary teaching a little better.

In selecting my examples, I have chosen six problems which have always troubled me in my own teaching:

1. How to relate the classroom discussion firmly to the course objectives in a way that students can see the connection.

2. How to examine a large class of students (about 150) on objective material without spending 3 months marking the papers.

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3. How to base the final grade on the level of skill at the end of the course. That is, how to avoid averaging grades earned in the second week of the course with those earned on the final exam.

4. How to give students an opportunity to do laboratory experiments for themselves at low cost and without cookbook recipes that destroy the whole spirit of experimentation.

5. How to build students' skills at responding to essay exam questions. How to make the objectives of such questions clear to students.

6. How to provide prompt feedback on exam questions so that exams result in learning as well as testing.

The rest of these remarks will simply describe some tactical approaches to these six problems.

Problem 1. How to relate the classroom discussion firmly to the course objectives in a way that students can see the connection.

Ever since I began teaching physics I have prepared carefully what the class was to cover that day. Usually I carried a sheaf of notes to class to make sure that I omitted nothing, from remembering to announce the assignment to remembering the tricky steps in a complicated derivation. In short, I strove for a well-choreographed performance. Gradually, I was able to turn my students more and more to texts where they could read what I would otherwise have said, thus leaving classtime free for students to talk and ask questions while I listened and answered. All well and good. My students stayed awake and were, clearly, learning. However, after ten days of this they were frequently unsure of what they had learned--and so was I. Classroom discussion tends to wander over the subject like a butterfly in a daisy field. It needs tying together.

I have used two devices. For one: two students, selected at random or sequentially, have been assigned to take class notes for the day. The notes are recorded in two spiral notebooks and signed by the authors. I then review the notes at the end of class in conference with the students, correcting errors, filling in omissions and generally patching things up. Students are not good note takers and they need the tutoring for its own sake. The notebooks are a valuable review and study tool for the whole class, particularly for those who are inevitably absent from time to time.

My second device is to draw from the notes a set of "study questions" which focus explicitly on the topics of the preceeding day. The study questions are handed out at the start of each class, covering the topics of the previous class. They may be trivial or subtle, ranging from definitions, vocabulary, or simple problems to examples of examination questions. In my view the study questions ought to include at least two life-size exam questions each day. By the end of a quarter the student will have in hand about 60 or 70 exam questions, a half-dozen of which will appear on his final exam. If the instructor is faithful and hard-working in providing study questions, he can promise that the final exam will be drawn entirely from study questions already presented. The student no longer has to guess how he will be tested.

Problem 2. An easily graded objective exam.

Physics tests are heavily weighted with definitions and numerical problems or exercises. Most physics instructors score these problems carefully, giving part credit for a problem which is well begun but goes astray on a decimal point, a calculation error, etc. Such marking is tedious and almost impossible in large classes.

In my work I attempted to restore some semblance of dignity to the multiple-choice test. After all, in spite of its flaws it is widely used in the GRE, various intelligence tests, license exams, etc. I turned to the computer for help--partly so that my students could use optical scan mark-sense answer sheets. First I enlarged the answer field from 5 to 9 choices. The optical scan equipment will record as many as three marks per column so that students were informed of that fact: No question requires more than three marks. Next I designed questions that required complex answers, for example, a and g is correct, a and g with c is half correct, h with anything is wrong, etc. There are 129 possible answers to such a question. Actually, it was necessary to consider no more than about 40 combinations for any given question. The rest of the 129 possible responses were equivalent to one or another of these 40. I have some examples of questions with me.

Problem 3. How to develop an achievement based final grade.

When the computer is introduced into the teaching game, it provides other useful services as well as paper grading. For example, every student's score on every test question is recorded. Since this data was available, I made the following policy:

1. There will be three hour exams of 40 questions each.
2. The final exam will contain 80 questions.
3. The final grade will be based on the final exam only; no averaging of grades.

4. Of the 80 final exam questions, 60 questions will be drawn from the hour exams, twenty from each. The 20 most frequently missed questions will be selected.

5. If you receive a score of x on a certain hour exam question, you will receive a score no less than x/2 on the final for that question.

6. The actual questions may be disguised with different numbers, different word order, etc. but will be the same questions.

The results were encouraging. Students studied material they were weak on. I believe the objectivity of the whole process helped some students to improve their exam performance over what it would have been in the conventional form. Certainly the system was popular. It was praised by students as fair and not "tricky." Some students were apprehensive about having so much of their course grade pivot on the final exam. After all, averaging grades lets the student take out "insurance" early in the course. I did lots of counseling with students who had scored 80-90% on the hour exams who realized they could still fail the course. They didn't fail, of course.

Problem 4. How to provide economical, effective lab experiments.

Most scientists agree that laboratory work, manipulating the real objects to see real effects, is the heart of science. Yet in practice, our laboratories are expensive, cumbersome and ineffective agents for "behavioral change." For years I have been interested and involved with the search for solutions to the lab problem. One solution which has been effective (and fun for me) is what I call the "lap experiment." A lap experiment is one which can be performed by the student at his desk or at home with modest, perhaps homebuilt equipment. To be effective, the "lap experiment" must actually reveal the physics. When I began to teach large classes of 100 or more students, the need for such experiments became crucial. I now have a handful of good ones, not enough for a whole course but from time to time I get an inspiration for a new one. When I moved to CSU, for example, I was for the first time on a campus with high rise elevators. My most recent "lap experiment" is to ride the elevator on a bathroom scale recording and analyzing the readings. Try it!

For today, I have brought a picture which is the heart of a "lap experiment" to illustrate the basic law of mechanics. It goes like this: I rig a camera and strobe light over an air table as a classroom demonstration. Two pucks are permitted to collide and the open-shutter camera records a series of dots as the strobe light blinks. The dots are formed by light reflected from a pin in the center of each puck. Polaroid film lets the class see the data at once. We take several pictures and generally "mess around" with the apparatus. At the end of the class hour each student receives one of these prints (I have about a dozen) to take home and analyze; that is, he is to select coordinate axes and construct graphical representations of the velocity and acceleration of each puck as a function of time. Since the axes are arbitrary there are an infinity of ways to perform the analysis. The physics just "pops out" as the accelerations are plotted. It's lots of fun.

Problem 5. How to build students' skills on essay exams.

In spite of my earlier remarks, not all of physics can be treated as a set of numerical, objective problems. Furthermore, if your students have strong verbal skills this should be built upon so that they can express their mastery of physics in their own terms. Therefore, in addition to multiple choice, computer graded exams, I also asked my students to respond to essay questions. How to apply the principles of behavioral conditioning to this method? Well, I decided that the biggest flaw in the essay question is that it becomes a guessing game with the instructor. So, in addition to providing a list of possible questions to the students in advance, I also provided some answers. I am sorry to say I failed to provide answers in advance but I did post them on my bulletin board. Now I am well aware that one of the reasons for the essay question is the general ambiguity of knowledge, that for many questions there isn't "one right answer." Fine. I posted two or three (and I would put up 5 if I had had the patience) examples of *good* answers to my questions. Students who completed an exam could walk straight out the door of the exam room and read instant examples of A (and C-) answers to those questions. Ladies and gentlemen, that does work! It results in obvious behavioral change, particularly in C students with poor verbal skills. They quickly learn to do better. The benefits to morale are also evident. Poor students in particular believe that essay exams are a guessing game with the professor. When examples of good and poor work are available, they *do* generalize from the examples to learn the art of the test. And the examples are effective precisely because poor students have been denied access to good examples in the past. They never wrote any! or at least not enough to reveal a general style or quality.

Which brings me to my final problem: instant feedback of test results. It is a relatively easy matter to post the correct answers to a multiple choice exam on the wall outside the classroom. It is even better to provide an annotated list which illustrates how to work out the problems. It is also valuable and easy to post good answers to essay questions. The important thing is prompt feedback which means that feedback in the form of correct answers must be available within minutes, even seconds after the response is made. Parenthetically, we are putting together a whole classroom wired electronically so that some of these ideas can be tested. A series of pushbuttons on each tablet arm will permit real time quizzing and instantaneous correction of answers as well as, ultimately, computer recordings of the results.

A colleague of mine deserves credit for my final innovation. A senior physicist with a brilliant, creative mind, he brought the ultimate in technology to the classroom. His students write all their essay exam questions using carbon paper. He keeps the original and they keep the carbon so that comparison of exam responses with one another and with his (posted) prototypes is possible. He reports observable improvement in writing skills and accuracy of response to the questions. Besides, his students like it!

AN INDUCTIVE APPROACH TO LEARNING LITERATURE

Susan Gorsky *

How often, in response to the instructor's lecture or an outspoken student's comments, does the teacher of literature hear the skeptical "Where did you get that idea from?" or the frustrated "I can't get anything out of a poem (or a play or novel)?" Often enough, it seems to make the most traditional instructor want better ways to lead a student into understanding for himself what there is to literature. One such way is through formalism -- the close analysis of the structural elements of a work of language art, an analysis grounded in the premise that form and meaning are mutually interdependent and that, in fact, form creates meaning.[1] That formalism can be effective in a classroom discussion of short poems is generally accepted. But the same analysts who acknowledge this use of the technique are quick to add that formalism cannot cope with long works, especially with the novel: lengthy books of prose fiction are too unwieldy to be dealt with adequately by the formalist's approach, and, these writers like to add, the novel relies less on formal devices and more on ideas, social concerns, human interaction.[2] This summary of the case is far too negative, for two

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[1] More detailed definitions and critiques of the school -- as well as examples of its application -- can be found in various handbooks of literary criticism. For example, see Sheldon N. Grebstein, Perspectives in Contemporary Criticism (New York, 1968), pp. 75-160.

[2] For instance, see Grebstein, pp. 75-84.

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reasons. The most realistic, nineteenth century novel (the kind defined as "the novel" by those antagonistic to formalism) is highly structured: ideas and social interaction are limited and defined by formal elements which cannot be ignored by the reader and which, in fact, he must carefully examine. Furthermore, a formalist approach in the classroom not only succeeds with works larger than the lyric poem but also offers an opportunity for inductive learning. The same students who, under the usual classroom arrangement would be unable to present cultural and historical backgrounds, to define genre, or to deal with literary tradition, can participate actively when asked to confront the work in front of them. Passive attention (or non-attention) to an analysis which may seem based upon the automatic application of prefabricated generalizations is replaced by direct involvement in their own learning experience. The role of the instructor is then refocused to that of resource, guide, and fellow student, and teacher and class join together in an experience of mutual education.

To a degree, we in literature all recognize some such philosophy: we may give introductory lectures on the period, on the genre, perhaps on the author; we define terms and offer theses; then we turn to the class and begin to ask the questions which we hope will lead the students into the poem or novel, guiding the class in a more or less preconceived direction as it finds its way through the work--if it is actually "finding its way" rather than being shown "the" path. Even when we establish a more inductive approach, we do not carry this option nearly so far as we might, and thus we vitiate an opportunity for education in its original sense: the drawing-out of knowledge in the student. A method which enables the student to draw from the work at hand all the material within it, would allow him to discover for himself all that we normally would try to "teach" him: the forms and concerns of the particular work; the interests, ideas, and techniques of the author; the generalizations about the time and culture which usually form the central concerns of at least introductory lectures. At the level of the individual work, formalism, through its close and objective analysis of the work, provides a means for inductive learning. But a whole course, too can proceed in this manner. A problem is posed or questions are asked, and the students attempt to find solutions by examining a series of works in close detail, using as little external information or values as is possible.

A course designed on such a model would have in a preliminary lecture only the establishing of the problem to be solved by the class and some ground rules (to be determined with the help of the class, if possible). It would then proceed through close inductive analysis of the individual works--relying primarily though not exclusively on formalistic means--both to deal with each play, poem, or novel, and to formulate solutions to the defined problem. The class should not be asked to deal with a question for which the instructor has a set answer or for which a definitive answer is available. Thus, fruitful options could include the definition of a period (What is Modernism?) or a genre (What is an Epic?), the exploration of a theme (What has been the effect of various structures of the drama or the novel?) or a critical method (What can sociocultural criticism offer to an analysis of nineteenth century drama?).* In coming to grips with each work the class would also be grappling with the overall problem posed in the course design, and might very well add to or move away from this problem as new areas opened up.

In the Spring of 1972, a seminar with no preestablished content or design provided the opportunity to put these precepts into practice to a greater degree than ever before. The course was set up as an inductive attempt to define the novel by looking at a series of eighteenth and twentieth century works which threatened to burst the bounds of such traditional concepts of the genre as used above (the "realistic", nineteenth century variety of novel). The key word in that brief description is inductive; a variety of standard (and non-standard) definitions of the novel were examined and found wanting, and the class was forced to work with--and constantly to evaluate--a series of tentative notions. With one "novel," The Waves by Virginia Woolf, we chose to test a fully inductive formalist analysis, following ground rules far more stringent and limiting than those which would normally apply. Because of its unusual style (passages of prose-poems in italics alternate with the self-contained interior monologues of six speakers), this modern work seems to be one which requires strict and absolute attention to form, but critics have consistently sought to impose upon it interpretations neither derived from nor fully consonant with its extreme and unique formal elements.

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*Obviously, the precepts of the "psychological theories" or of sociocultural criticism would need to be introduced. However, these too could be discovered directly by the student from primary sources (which, for the sake of efficiency, would be chosen by the instructor). The approach to the literature itself, can, of course, remain that of the "new critics."

The class set up the following guidelines or rules: (1) no outside references other than those needed to check allusions or definitions within the text; (2) no references to the novelist, her life, opinions, other works (fictive or otherwise); (3) no introduction of outside material, such as historical, philosophical, or cultural precepts about Modernism. The students (and teacher-student) agreed to keep notes of points which they would have brought up in a different classroom context, of questions which they would have asked or which once asked were not answered satisfactorily, and of any losses they felt to arise from the ground rules of our exploration.

Probably unaware that she was doing so, one student echoed a traditional argument against formalism when she observed, on the day before we began our discussion, that the novel was too long to allow for the kind of full, word-by-word analysis accorded a poem. And, on the first day, after spending some forty-five minutes on six sentences from the two-hundred page work, we were in full agreement. But the impossibility of total comprehensiveness is barely an argument against the approach, for any analysis of a novel in a limited time will necessarily be incomplete, and if formalism is as complete as traditional modes while enjoying additional benefits, then its value cannot be challenged on those grounds. Based on class response, an inductive use of formalism is successful. If we had more time, we could in fact have dealt with more, but even within the limitations present, the approach led us more accurately, more sensitively, and more satisfactorily into the novel.

It would be impossible and inappropriate to reproduce the class discussions here, but some samples and some generalizations seem necessary. On the first day, we isolated the topics to be covered: verbal style, point of view, structure, the italicized sections, image patterns, image sharing, character juxtaposition, "plot" (or what substituted for it), internal geography, the missing hero. Our discussion of verbal style, the first point, got us into the lengthy analysis of the six line section mentioned above. After the first introductory italicized section (the work of an omniscient narrator whose only other function within the novel is to indicate the speaker, by noting "said Bernard," "said Rhoda," and so on), each of the six narrators "utters" one brief "speech" in turn:

> "I see a ring," said Bernard, "hanging above me. It quivers and hangs in a loop of light."
>
> "I see a slab of pale yellow," said Susan, "spreading away until it meets a purple stripe."
>
> "I hear a sound," said Rhoda, "cheep, chirp; cheep, chirp; going up and down."
>
> "I see a globe," said Neville, "hanging down in a drop against enormous flanks of some hill."
>
> "I see a crimson tassel," said Jinny, "twisted with gold threads."
>
> "I hear something stamping," said Louis. "A great beast's foot is chained. It stamps, and stamps, and stamps."

The speakers are infants at this point; throughout the novel, we decided (on the basis of the content of the individual monologues and the relationships among them), their words reveal a pre-verbal level of thought made verbal in order to establish thematic points about human nature and human communication. In these six lines we could identify (in retrospect) images which signal each character throughout the work (Jinny's rich fire colors, Louis's chained beast), and those which achieve special significance for the six as a group (the ring which eventually comes to suggest a circle of human unity). The rhetorical parallelisms and sound repetitions of these lines helped to suggest the impact which form has in the work, and the nearly identical patterns of syntax and diction continued in the rest of the opening chapter provide the first indication of a strange unity among the six speakers. Words and phrases such as "purlieus," "reprieve from conversation," "stricture and rigidity," and "oleaginous spots," used when the speakers are no more than six or seven, suggested again that the utterances could not be regarded as speeches, thoughts, or stream-of-consciousness.

From this beginning, we worked our way through the other topics, adding new ones which arose from class discussion. From a study of repeated images we were able to develop a sense of character identity, of the speakers' ambivalent attitudes towards man, life, love, nature, and death, of human interaction and communion at some cosmic level. From sentence structure we recognized the similarity among the speakers. From the dual structure of the book (the alternating italicized sections and interior monologues) grew our sense of the significance and limitations of perspective as well as our acknowledgement of the book's assertion of the cyclic form of human and natural life. And slowly, by delving into one after another of these technical questions, we were able to build towards a consideration of impact and meanings: to recognize and identify the questions which the novel raises about the possibility of knowing oneself or another, about the significant limitations faced by the individual--with his single point of view and his single life, about the links which exist among six who share a common past and between them and all men, and pre-eminently, about the limitations, problems, and values of the novel as an art form.

One of the characters, Bernard, has a lot to say about this point, asking, "Are there stories?" and suggesting that "life is not susceptible perhaps to the treatment we give it when we try to tell it." But he need not have said this overtly, for, as we discovered, the novel says it through form. And it is, we decided, superfluous (though interesting) to turn to A Writer's Diary and see Virginia Woolf saying it again. It is interesting to contemplate a relationship between Bernard and Virginia Woolf, to note that in Bernard's queries about art are reflected the doubts and fears of Mrs. Woolf and her contemporaries, and in his perseverance, their own faith in experimentation. It is of historical and cultural significance that the novel shares with those of its period--and with the non-literary output of the early twentieth century--a questioning of basic humanistic values. And so on.

We did lose some of this (though we could make it up at the end, thanks to the notes we all took). But what we gained far outweighed the loss, and in the normal classroom setting, such a dogmatically one-sided approach would not be necessary. The accuracy and insight afforded by formalism would be supplemented by material from other approaches: history, philosophy, psychology, the non-literary arts, and the like. But even with the self-imposed limitations, the experience was positive. Our analysis was accurate: we avoided bias and a superimposition of critical precepts or personal preconceptions about the work. It was sensitive: we came to grips with the book in its own terms and with full appreciation of its strengths and weaknesses. And it was satisfying, in part because we were able to combine the basics of several areas--aesthetics, literature, language and literary criticism--into an unusually comprehensive analysis of a large work. Finally, it was exciting. Class discussions frequently ran over the assigned periods, one student became sufficiently involved to consider adapting the novel into a play, and students in evaluative comments indicated generous approval of the experiment. Specifically, students appreciated the "discipline" which was enforced through the emphasis upon objectivity and concreteness (absolutely no unprovable theorizing was acceptable), and noted the "added dimension" given the course by a variation of approach. Further values were seen in the introduction of "new critical tools" to the class, and in the unusually vivid demonstration of the strengths and weaknesses of a major critical school. In view of these features, one student recommended that a series of such experiments, involving various modes of criticism, be adopted in a future course.

This class was an unusual one: eight students (plus frequent guests), all of whom were involved and interested in the subject. However, judging by the increase in class response, by the students' enthusiastic, intensive work, and by their comments, the method is successful. And, in a class in which students are skeptical and uninterested, the approach offers added values. Through the application of formalism, the questions and complaints with which this paper opened are answered: the student can see "where...that idea" came from, and should no longer be unable "to get anything out of" the poem, play, or novel. He should be able to see how a work of art (and not just a short lyric poem) is put together, and how it uses various techniques to achieve impact and to involve its reader (or listener) intellectually and emotionally. The most disaffected student (assuming that he is not uninterested in all mental activity) still stands to gain something from this method, for he can learn a means of inductive analysis which may be valuable in fields other than literature. While formalism per se is not transferable, the inductive method (borrowed from scientific research) can be applied to the understanding of an event or period in history, a social phenomenon, or a philosophical question, as well as to a play, or poem, or novel. Working out from within, paying close attention to the elements of the problem or the work under consideration, discovering for himself what the questions are and how they can be solved: all of this involves the student directly, challenging him with a problem which he can solve for himself and yet which is, in fact, a challenge, and allowing him to participate in--and in some ways determine the quality of--his own learning experience.

TEACHING ONESELF TO WRITE A POEM

A. Turner *

At the risk of angering both poets and pedagogues, I begin by assuming that the ability to write a poem is as universal as the ability to use any other form of verbal communication, and that like any other form of verbal communication, it can be taught--in a classroom. It can, of course, be self-taught outside a classroom. But I share with my colleagues the belief that classroom technique can increase the speed of self-teaching _if_ it remains inductive. The following course in poetry writing is planned to facilitate the self-teaching process by a series of sequentially arranged exercises in which the beginning poet is lured away from the habits of _expository_ verbal communication--the essentially deductive methods of thesis statement, expanded by definition, analysis, example, comparison, etc., according to the rules of classical rhetoric. Instead, he is encouraged to use the method of _affective_ communication--the essentially inductive method of combining words by free association, then examining them in order to discover what they have said and the principles by which they have achieved their affective force.

The recognition of a need to wean beginning poets from the habits of _expository_ to those of _affective_ verbal communication is based on the premise that the function of man's intellect is to pattern his diverse perceptions of experience; that he uses these patternings either (1) to regularize experience and so protect himself or (2) to surprise, disturb, and so energize himself. In verbal communication, this means that he uses words in their regularizing function to fulfill social expectation: to write laws,

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contracts, business letters, interoffice memos, news and research reports, textbooks. He uses words in their energizing function to write plays, novels, jokes, short stories, poetry. And he combines the two uses in advertising, editorials, reviews, sermons--wherever feeling needs to be disguised as reason or reason needs the support of feeling. The poetry of the Renaissance was taught as such a combination. Poetry was conceived as rhetoric in the service of logic, as an extension of persuasion. This concept is still held by a large segment of the population. But the practice of mid-twentieth century poets continually denies that the poet's feeling should be expressed in the socially acceptable forms of reason or rationalization. The function of poetry today, as he sees it--and writes it--is to shock.

To create this sense of shock in a reader is extremely hard if a poet's verbal reactions to feeling (at least all those he is willing to see on paper) are conditioned wholly by classroom analysis of what other poets have put on paper. Even the most assiduous study of Ginsberg's "Howl" puts poet-as-reader at one remove (if not more) from the direct experience which produced "Howl." He cannot himself howl unless his own toes has been stubbed. But he has probably never howled on paper when his own toe has been stubbed. The point of this sequence is to make him howl on paper before he is even aware that he is howling, and only then to learn to control his cadences.

The introductory exercise of the sequence, therefore, stresses the value of free association. Single words are used, since single words associate more freely with each other than words already embedded in sentences. Concrete words are used, since abstract words convey little meaning unless abstracted from the experience represented by concrete words.

The remaining exercises are grouped (Part I) under literal meanings of words and (Part II) non-literal meanings of words, on the assumption that a direct sensory perception precedes the substitution of that perception by a non-sensory perception: i.e. the word cat for the animal cat before the word cat for the feline personality traits of a gossipy neighbor.

Though I realize that isolating poetic principles and teaching them in sequence is artificially neat compared to the complex process of writing a poem and virtually impossible in the sense in which scientists isolate and sequence principles in the laboratory, I believe those principles can at least be pointed to and talked about one at a time. The student will be performing the whole process every time he does any of the exercises, but he will become aware of what he is doing only gradually and in small enough steps to acquire control--the power to revise his random jottings in order to realize whatever pattern he sees suggested in their initial mass.

SEQUENCE OF EXERCISES:

Part I: Literal meanings of words

- A. The value of concreteness
- B. The value of rhythm.
- C. The value of spacing.

Part II: Non-literal meanings of words

A. Repetition that does not repeat.

   1. The value of allusion.

   2. The value of opposites.

B. Metaphor

   1. Not the same, but recognizably similar.

   2. Absurd, but not quite.

C. The value (and risks) of ambiguity.

Depending on the age and literary sophistication of the class, further details of technique can be introduced and reinforced in group discussion of the students' own poems written in response to the exercises. The process of polishing them after they are put on paper will be much the same as that now used in private and academic workshops all over the country.

The chief innovative function of the exercises is to start poems, to surprise the students into writing them, into discovering that they have written them. What they learn by this method will have been in a very real sense self-taught.

INTRODUCTORY EXERCISE: The Value of Free Association and the Importance of Sequence

1. Ask students to list the first eight things which they remove from their pocketbooks (or pockets) in the order of their removal, then to rearrange the list in the order of increasing importance to the owner.

2. Have three or four of these lists written on the blackboard.*

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* These will be poems, though it is not necessary to use the word, even inadvisable, if the class is a high school or freshman college class. Just call them word exercises.

3. Ask students other than the authors to explain what each list shows about its author.
4. Copy on board the prose explanation of each "portrait."
5. Ask students how the explanatory equivalent differs from the original list. (Hopefully, the comparison will evoke observations that the poem is more compressed, more specific, more fragmentary, more concrete, more emotionally intense, yet quite as psychologically accurate as the prose equivalent. No generalizations about poetry, however, need to be made at this time. The same observations will be made and need to be made again as the result of other exercises. Generalization tends to become dogma at this stage and should come as the result of all the writing exercises, at the end of the unit.)

Example:

Original list:

lipstick
Kleenex
4 keys
postcard from Spain
10 cents
Wrigley wrapper
dentist appt.
library card

List in order of increasing importance:

lipstick
Kleenex
Wrigley wrapper
10¢
dentist appt.
library card
postcard
Spain

KEYS!

Typical reactions which can be expected from college upperclassmen to a comparison of the two lists:

"She wants out."

"She moves from trivial, everyday things to romantic escape."

"The position of keys in the first list suggests locking in; in the second list it suggests unlocking, letting out."

"The poem moves from minor everyday restraints like putting on a public face to major ones like paying library fines and having your body jerked open by a dentist; then it turns away from all that."

"The capitals on Wrigley and Kleenex are gone, cents and appointment are just abbreviations in the second list, but KEYS is all capitals."

"See how the words at the end start spacing out as if reaching toward Spain."

At this point you can elicit the remark from students that each list has drawn a portrait of its author, and you will be able to show the technical value of sequence in producing each portrait. Repeatedly, you will find that the person who wrote the poem did not realize what he had said about himself until the other members of the class had pointed it out to him. He could, therefore, not have written the poem by the method of thesis: amplification.

Other free association exercises which can supplement or be substituted for the above:

1. Ask students to write down the first six words which occur to them after the instructor has clapped his hands (or yawned or thrown something in the wastebasket or--). For example, I clap; the students write:

Student A.	Student B.	Student C.	Student D.
up	out	hi	good
bright	scatter	come	you can do it
red	shots	happy	more
now	hit me	hot	yes
do	no	firecrackers	push
go	there	bang	fun

Ask students what unity (feeling, mood, attitude, pattern of any kind) they find in their sequences. Ask if a sequence can be rearranged in an order that will make its unifying factor more evident. Ask how the rearrangement has made the unifying factor more evident (compare with other rearrangements which do not reveal the unifying factor so well).

2. Have students take turns drawing six words at random from a deck of cards, each of which bears a concrete word, with several universal connotations. For example, *black*, *white*, *red*, *green*, *blue*, *sea*, *sky*, *grass*, *rain*, *wet*, *dust*, *fur*, *hot*, *warm*, *cold*, *dry*, *fish*, *mouse*, *deer*, *dog*, *whale*. Have each student arrange the six words in a sequence of increasing importance to him. Have several of the lists put on the board. Let students note what each sequence reveals about its author. Let instructor take advantage of this opportunity to show *how* the different ordering of words has suggested the different attitude, concern, or personality trait of the author.

Suggested homework assignment (to follow any of the above exercises in free association and sequence):

Ask students to visit a person's room (bedroom, study, playroom, garage, kitchen). Ask each to write down the first ten things in the room which strike his eye, in the order in which they strike it. By contemplating the close up list, he should decide what characteristic of the owner it reveals. Ask him then to rearrange the list in such a way that this characteristic is emphasized. When the results of the assignment are passed around or projected on the board, the class will try to determine what characteristic or complex of characteristics the lists are arranged to reveal. Both success and failure in making these characteristics evident can become the basis for constructive criticism.

The principle which can be drawn from the free-association and sequence exercises, preferably by members of the class, is that the associations of the human mind are never really random, that feeling (attitude) imposes a pattern on any material presented to it from outside or dredged up from the subconscious, that we _discover_ what we mean before _deciding_ what we mean.

PART II:* NON-LITERAL MEANINGS OF WORDS

Exercise A: Repetition That Doesn't Repeat

1. _The value of allusion:_

   a. Write on board a typical newspaper want ad:

> Good home wanted for expensive beagle
> bitch: good watchdog, never strays,
> protects children, keen nose, pedigree,
> all shots. Available at once.

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* Because of the limited space in the I.T.G. anthology, I shall not detail here all nine of the exercises which comprise the rest of the sequence, but shall give three to illustrate the method. The rest will be furnished on request.

Substitute the word mother-in-law for beagle bitch. Ask why the ad in its first form was not funny (familiar, expected), why funny in its second form (unexpected, yet apt. It fits a bitchy mother-in-law). Ask what would be the relative effectiveness of an ad reading:

> Please, somebody, take my mother-in-law off my hands.
> She never leaves the house, nags the children, meddles
> in my business, talks endlessly about her family
> pedigree, and is impervious to all hints to leave.

(It would be less effective because the author has just stated the familiar complaints in a familiar way. The familiar want ad and the familiar complaint were more effective when used together, *i.e.*, the familiar in an unfamiliar form).

b. Write on board a typical lost-and-found ad:

> Lost: one black patent leather purse containing
> keys, a Halle's charge-a-plate and a change purse
> with fifty cents. Call 584-7236. Reward.

Change it to:

> Lost: one brown-haired head containing cents,
> Saturday's horoscope, and three definitions of
> a minor poem. Call 777-7777. Reward?

Is the author complimenting himself? What is he saying about himself? How does the form help him say it?

Change it again to:

> Lost: one rat cheese, containing Peter Rabbit,
> three gallons of kerosene, and a rat. Call six,
> call six, reword.

Is the author here saying something about himself? Is his mood serious or funny? How does the form help him say it?

c. Have each member of class write three lost-and-found ads, putting down at random the first things which come into their heads. Have them choose one which seems to express a feeling or attitude and modify it to heighten that feeling. Have three or four written on the board and ask class if they can tell what feeling each expresses. If they can't or can tell only partially, ask class to help author work it toward what he thought he was expressing.

The general principle which can be drawn from this exercise is that the expected form itself says by long and familiar association, much of what the author would otherwise have to put into his poem. For instance, the lost-and-found ad form says "I am aware of a loss, aware that losses are usually abbreviated and made public with expectation of repair." All that he adds to this familiar form is the implication, "But my loss is too great for either accurate naming or external repair. I've lost me, and I'm amused" (no. 2), or "I'm lost and I'm frantically groping" (no. 3).

d. Ask class to make a list of all the traffic signs they can think of which contain the word no. Taken separately, what does each mean? What is the purpose in posting them? (Safety.) Have class make a list of five or more of them which, together, will mean something different from what each originally meant.

Example:

Random list:

no stopping
no exit
no U turn

List in order of mounting frustration:

no thoroughfare
no stopping
no passing

no parking
no thoroughfare
no left
no right
no passing
no entrance

no U turn
no left
no right
no exit

List in order of increasing compulsion:

no exit
no thoroughfare
no passing
no U turn
no left
no right
no stopping

List of antitheses, in order of increasing ridiculousness:

no stopping	no turn
no passing	no thoroughfare
no left	no thoroughfare
no right	
no entrance	
no exit	

Suggested homework assignment:

Turn a familiar formula into something else: a menu, a medical questionnaire, a list of street names, an application for a driver's license. Again, begin by randomizing your imaginary questions or names of foods or names of streets, etc. Only the form will be familiar to your readers. What you fill it with should be your own unplanned, spontaneous outpourings. After, and only after, they have poured onto the paper, should you decide what you have said and arrange them in some way to emphasize it.

Sample result of assignment:

QUESTIONNAIRE

Is it white
Were there two?

Have you shells
Are they sharp?

Could you reach
Have you seen?

And still tell
Black from red?

In from out?
In? From out?

PART II: NON-LITERAL MEANINGS OF WORDS

Exercise B: Metaphor

1. Not the same but recognizably similar

   a. Begin by asking, "Suppose you enter a room and find on the table one empty paper cup, one sandwich wrapper, two coats (one male, one female), two pairs of boots, two piles of books. The light is on and the door is open. (Write these details on the board.) What would you think had happened?" (The response should be something to the effect that a boy or a girl had probably been studying alone and had been joined by a boy or girl friend. They have probably gone out to get more food. They will be back to study together soon.) Add to the list already on the board: "two full cups, two fresh sandwiches, boy and girl, 'studying' together soon."

   b. Ask class to suppose that a poet makes the following substitutions: for coats, books, food containers (suggesting domestic comfort, purpose, nourishment) he substitutes two silk tents; for boots (suggesting separateness, arrival, departure, aggression, flight) he substitutes two dogs; for the fact that the boots are now off duty, yet waiting in readiness, he substitutes sleeping dogs; for the light of the room, he substitutes one moon; for the warmth of the room, he substitutes one fire; for the attraction between the boy and girl, he substitutes one fire (in a second sense of the word); for the open door, no substitution of the actual word will be necessary, because its position in the sequence will now suggest other meanings of door (the way, the opportunity, the attraction to enter; sex); for the expected sequel, the poet substitutes one silk tent soon.

> Two silk tents
> two sleeping dogs
> one fire, one moon.
>
> One fire, one door.
>
> One silk soon.

Ask what emotional reaction the poet has had to the facts. (Romantic, warm, comfortable). Ask what other possible reactions to the facts he has deliberately excluded. (Indignation: these people are indulging themselves instead of studying as they should. Or condescension: the tawdriness of love in a cheap and hackneyed setting could have been emphasized.)

c. Ask class what substitutions could be made to emphasize (a) the cheapness and banality of the love, (b) the shameful betrayal of academic duty, (c) any other emotional reaction they may have to the scene. Allow ten minutes to do this, then have at least three put on the board for discussion.

Suggested homework assignment:

Give students the bare facts of a scene which the instructor has observed and which has moved him deeply (just the bare statistics, not his reaction to them) or give them the bare facts of a news story which has moved him to recognizable anger, pity, fear, laughter, etc.; then ask them to make substitutions of objects physically unrelated to the actual incident, but evoking the same feeling, i.e. the same kinds of substitution as dogs for boots, tents for domestic comfort. (The value of this assignment should be to show the difficulties of private versus public connotation and between fresh metaphor and cliché.)

2. Absurd, but not quite

   a. Begin by telling class that the purpose of today's exercise is to be as wildly, absurdly nonsensical as possible. Tell them to let go and write down the first thing that comes into their heads in response to the request, "Make me a crazy sandwich:"

   Examples:

   1. Clouds and violets salted with bees.
   2. Glue and beetles, any bread.
   3. Spam between thick gloves.
   4. A day and a night;
      another day, another night;
      stars, dawn, a blue sea
   5. Thick finger between teeth
   6. Patsy, then Dick, father and mother
      spread over,
      then Uncle Rich
   7. Crunch and crackle,
      cream cheese.

b. Ask students to identify the sensation suggested by the parts of each sandwich. For example, clouds and violets are delicate, natural things; together they are associated with dreams, spring, romance, sweetness; salt is tang, sharpness; bees suggest romance, business, and sting. This first sandwich would suggest a complete emotional meal, even if literally it could not be eaten. No. 4 is a Dagwood of many layers, starting with the ordinary routine sequence of day and night (bread with nothing between), then surprising with pleasure, hope, and finally clarity. The fact that the top of the pile is sea, rather sky, suggests the metaphysical possibility of clarity being also death. In No. 7 crunch and crackle suggest the crispness of the initial experience of biting into this sandwich. Cream cheese makes the heart of the matter, the center of the experience, which is smooth, sticky, bland.

The principle re-illustrated by this exercise is that nothing the human mind conceives is total nonsense when analyzed by that or another human mind. Every crazy image or combination of images represents at least an attitude. In addition, each is, when looked at closely, a metaphor. In each of these examples it is a metaphor not by rational choice, nor yet by accident, but by the process of subconscious choice which makes a person react to touching an unfamiliar substance before he knows whether he has reason to react that way or not. An unsophisticated class will be able to be just as wildly suggestive as a sophisticated class.

Suggested homework assignment:

Draw me a crazy picture of God; stroke me a crazy fur; build me a crazy house; draw me a crazy portrait of yourself. Be sure to make the crazy thing first; next decide what it means, and only then tinker with it to make it mean even more what it means.

CONCLUSION:

These exercises can take as much time as the instructor wishes or the sophistication and interest of the class permit. They could be used one each day for a week, repeated on consecutive days for a week, used one each week, interspersed with class sessions, which either take the form of workshops in which students react to each other's work or the form of critical discussions which examine published poems. For example, Auden's "The Unknown Citizen" can be used with the exercise on the value of allusion for creating irony; Michael Benedict's "Divine Love" is a fine illustration of a "crazy" picture of God. In other words, these exercises in discovering what poems are made of by writing them can be as useful in learning to read poetry as to write it. The chief difference between using them in a literature course and in a writing course would be that in the literature course one writing exercise and at least one student writing assignment might precede a week of reading published poems; in a writing course a week of writing and analysing student poems would include a few published ones to be criticized at the same time and by the same criteria as the student poems. The emphasis would be different, but the method the same.

Nor does the method need to be limited to English courses. If free association can successfully initiate poems, why, I asked myself, can't it initiate hypotheses in other fields. After all, isn't "having an idea," any kind of an idea, similar to detecting the pattern of an emerging poem in free-associative material? Here, of course, I'm skating on very thin ice. I don't know other fields, so, for fear of making a fool of myself, I shall only throw out a very few tentative questions. In fact, some teachers may already have used free association in their classes, more extensively than I. I have heard of artists using it to begin pictures: a pencil doodle to suggest figures; an inked string to make a pattern on the underside of a piece of paper which is then turned over and "edited" or developed into a picture; the grain of a block of wood to suggest a sculpture to be carved from that wood. Though I have no experience in the field, I see no reason why the same process could not be applied to the composition of music. In fact, the cutting and splicing of tapes in making electronic music is in a real sense an editing of free-associative sound to produce controlled pattern.

In areas of non-affective communication, such as the social or natural sciences, I can see free association as a useful device for unclenching the mind in order to invite new hypotheses. Suppose, in a class in psychology or sociology, one should show a large picture of a strongly emotional face--a face which seems to be looking accusingly at each student in the class. Suppose, then, one asks the group to write down as fast as they can what they think that face would be saying if it were speaking. A comparison of these lists could be used to provoke discussion of the extent to which social and physical stereotypes produce stereotyped responses, the extent to which individuals can be made to feel guilt, even though they're not guilty, or a discussion of the nature of guilt and how it is created.

Or suppose in a class in economics or marketing or advertising, an instructor asked the students to put down the first twenty-five words or phrases which come to their minds when they hear the words meat, beans, eggs (one at a time, in three lists). From the singling out of corresponding and contrasting details from the lists, the instructor could lead the students to make such observations as "The association of beans with poverty has obscured their economic and dietary value;" "The fried egg is all that people think of when one says eggs." These and similar remarks would provoke such hypotheses as, "Social Prejudice gets in the way of satisfying real economic and nutritional needs." Such a hypothesis could then be tested by individual student-initiated field projects.

I repeat: these exercises are not a complete course. They do not teach all a poet needs to know about meter, structure, phonetic intensives, tone, irony, etc. They are not designed to fill a whole quarter or semester. They only pry up the lid of the poetic process. They teach the student that if he begins with his own verbal free association, watches for emerging pattern in these (i.e. sequence, repetition and the interruption of repetition, expectation and the frustration of expectation), he will find that he has written the rough drafts of poems. With time, patience, and ample discussion guided by an instructor alert to take advantage* of both successful and unsuccessful poems to illustrate poetic principles, the initial free-associative lists with which the student started will begin to sharpen and to shape, and after working through the exercises he will have enough understanding of what has happened in the initial, unconscious steps of writing his poems to become a more controlled craftsman in the final stages of polishing them. Even if he never becomes a professional, he should have enough understanding of what goes into the making of a poem to read professional poetry as poetry, instead of as expository prose.

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* I recommend that the instructor who teaches these exercises do each of the assignments which he asks the class to do and submit his own efforts to the class for criticism along with theirs. He will thus give credence to the idea that poems are discovered before they are composed and that the process of discovery is much the same for the amature and for the professional. His students will also find that the raw material from which they quarry their poems is much the same as that from which he quarries his own, and in no way inferior.

In conclusion, free association is induction at its earliest stage. It produces the material to be identified, compared and finally generalized about. It is not anti-intellectual. It does invalidate all of current classroom practice, but if it is used as the first step, it motivates the student by making him discover for himself the principles which, if lectured to him, might leave him with the feeling that he is unworthy or incapable of discovering them himself. That is an attitude which a beginning poet cannot afford to have. I like to think it's one which the beginning economist or psychologist or philosopher or biologist can't afford to have either.

ON TEACHING IN THE UNIVERSITY: AN HISTORIAN'S RECONSIDERATION

Lance C. Buhl *

The function of the Arts and Sciences in higher education has always been to graduate men and women who are intellectually resourceful and independent. And, in a highly bureaucratic, technologically sophisticated, mass industrial society -- one which places increasingly severe strains on the proposition that an enlightened citizenry is both viable and necessary -- the burden on the Arts and Sciences has become heavier by far. The challenge is not to produce more highly specialized bureaucrats or technicians, except perhaps in the public or human services, but to educate more resourceful people, people who are skilled in problem-solving of a general sort and who, above all, have developed skills appropriate to understanding and affirming the best of our cultural heritage.

I think these statements fairly approximate to a generalized definition of the value and function of higher education. None of our particular definitions is likely to vary greatly. Where we begin to differ, I suspect, is in the estimation of what constitutes success in meeting the goal. How do we measure the achievement of any one student? Are we satisfied that we have acquitted our responsibility when we can say that ten percent of our students have demonstrated a relatively high level of intellectual involvement and capability? Twenty percent? Forty? Seventy? And, of course, we would quarrel even more about where it is that success ought to be measured. During or just after any course, any sequence of them, an entire curriculum?

My position is, first, that it is absolutely essential that each of us reaffirm, course by course, the commitment of Arts and Sciences to produce intellectually resourceful graduates. Second, we cannot be satisfied that we

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have succeeded when only a minority of our students, 'the saving remnant' of the intellectually motivated and talented, meet the standard. We must avoid the temptation to discount the intellectual potential of the majority. It is a potential, I will admit, that is not often tapped. I believe it exists. Finally, the testing ground for each of us in public higher education is the classroom itself. It is the day by day development of our courses that is, far more than most of us care to admit, the crucible for success of failure in the university's overall mission. On pedagogy, on teaching, then, rests a tremendous and critical burden.

Over the past three quarters, in surveys of American history since 1865, I have adopted a method that seeks to maximize the involvement of the majority of students.

It incorporates a redefined role for the instructor. While continuing to serve as a certifier of performance, he has become simply one of a number of potentially equally valuable and valid resources for the student.

The method reduces the place of the formal lecture. Only about twenty-five percent of classtime is given over to it. The primary reliance for the discovery and transmission of meaning in history is placed on student peer groups. Structurally, the class is randomly divided into groups of five. Nearly three quarters of time in class is devoted to group discussions of historical situations and the resolution of historical problems.

Mastery of course content this quarter is demonstrated through five objective unit tests of twenty questions each and a final essay examination covering all five units. The five unit tests are qualifying exams; they do not count for grade. However, a student must pass each with a score of 14 or better in order to get a grade for the course. Immediate feedback for reinforcement's sake is provided by going over the answers after the score sheets have been turned in.

To prepare for these unit exams, individual students and their groups direct their efforts to answering five required sets of study exercises. These, too, are ungraded. Each exercise consists of about fifteen questions which demand a considered judgement of men, movements or events in American history. The questions are geared to a single text. It is the student's and his group's responsibility to gut the text -- take from it only what they need -- in order to develop short, but plausible justifications for their answers. Together these exercises, then, form a kind of learning laboratory, not self-pacing to be sure, but geared to developing for each student a working orientation in American history.

Each set of questions is developed around the broad topic area in which five case studies have been constructed. The case studies -- on the election of 1868, on the Pullman Strike of 1894, on Bull Moose politics in 1912, on the elections of 1938 and on the J. Robert Oppenheimer case -- define the student's confrontation with history. For each study, each group is directed to play a particular role -- citizen group, blue ribbon commission on labor unrest, dejected party workers, presidential advisors, congressional aides. The task is to come to some determination about the particular issue specified and to write a short, formal report arguing the group's case in defense of the decision. While secondary sources are recommended and placed on reserve, compilations of selected primary sources form the heart of investigative work in the course.

A student's grade is based, not only upon his own study and research, but also upon his work as part of the group to which he is assigned. In fact, half the grade is the average mark for the five group projects. Another thirty percent is the mark awarded by the group for contributions to its work. Only twenty percent of the grade derives from the score on the final examination.

Each student in a group is responsible for editing and otherwise coordinating one of the five group projects. A group that receives an average grade of C or less for the five projects may assign only one A and one B in evaluating its members. Otherwise, groups may award grades as they will, so long as they justify each award assigned.

Finally, as a source of feedback to me and as a goad to write creatively and freely, each student must maintain a personal log or daybook of the course. An entry is required for each day in class. The logs are ungraded.

Now, historians and others in the humanities and social sciences will recognize much that is not new or extraordinary in this description. Yet, it is fair to say that, in the combination of parts, I have worked out a learning environment which is quite different from the traditional mode in which I passed my formal education and of which, until last year, I had been a consistent practitioner.

At the risk of slighting what has been a rich tradition, let me specify what appear to me the essential features of the teaching method I abandoned. The undergraduate and graduate schools I attended, to a considerable extent, depend on the familiar recipe of instructor as authority, lecture as dominant mode of intellectual communication in the classroom, and the reading and research of relatively highly motivated students as the key to academic success.

It always seemed, too, that each course was assumed to be comprehensive, at least within the boundaries of its formal catalog description. In terms of student behavior, this meant that each individual was responsible for digesting all the material assigned, including the lectures, and must prepare to be tested somewhat randomly as to information covered.

Three questions seem worth pursuing to some depth. First why abandon a teaching method I mastered as a student and employed as a university educator? Second, how does one come to adopt a system in which pedagogical staples like lecture, discussion, coercion, grading, etc. are drastically rearranged? Third, how has the method worked? More precisely, has it worked any better than the traditional one?

The short answer to the first question is simply that the traditional pedagogy did not seem suited to fulfilling the purposes for Arts and Sciences that I formulated at the outset of this paper. The long of it is that I had begun to suspect, long before I became concerned about the function of public higher education in general, that my own courses were not very effective. That is, they were failing to meet two standards both of which relate to the experience with history I was and am committed to stimulating in my students.

First, I expect that most, if not all, my students will discover something of the excitement in history -- in the recurring confrontations between man and his physical, social and moral environments -- that led me toward a career in the field. I want at least seventy-five percent to leave my course with a conviction that there is something of value in studying history. More hopefully, I want each course to serve as a springboard for stimulating further inquiry into the subject by students after they leave our hallowed halls.

Second, I insist that every student in each of my courses be confronted with a demanding intellectual challenge. Stated another way, I am committed to maintaining standards of intellectual rigor appropriate to the level of course taught. How can any student experience the excitement of history unless he is confronted with its relentless complexities? He cannot. My minimum professional obligation is to ensure that each course meets acceptable standards of difficulty. In this way alone can students develop the conceptual tools requisite to a continuing appreciation of history and of its dilemmas.

Measured against these standards, my courses were not successful. I venture the very optimistic guess that they had never reached -- excited -- more than thirty percent of the students. Moreover, those students who had recognized and responded to a tough intellectual challenge constituted, if anything, an even smaller minority, because a number of those who had been excited by history had come by way of the illusion that the discipline was easy. By and large, the successful students had learned quite early how to play the academic game: first discover how to keep alert enough in class to take notes that correspond to the lecturer's signals about what he regards as critical; then, point toward examinations by using those signals for the limited purpose of reading secondary sources accordingly. The key is to figure out the instructor and, then, to develop some facility with the jargon of the discipline.

The failure lay in the fact that so few of even these students had ever been forced to work through a difficult historical problem relying on their own mental resources. So, while their basic intelligence and shrewdness was certified, they remained in a more meaningful sense quite untested. If this were the case for the more successful students, what then of the bulk of them? I had to conclude that at least two-thirds -- probably more -- of the students had either not been capable of responding to an intellectual challenge or had not found one worth meeting.

Initially, I opted for the first interpretation. It seemed plausible. Conversations with colleagues through the years about inability to awaken students seemed always to conclude that the task was impossible. Indeed, the pervasive assumption underlying the older pedagogy is that most students are not capable of, or are not sufficiently motivated in, or will not take the time for, accomplishing serious academic work.

There are some direct and disturbing consequences of this assumption. Because it explains typical experiences so well, there is of course little reason to tamper with teaching. Or, if anything is to be altered, the primary purpose in Arts and Sciences is to attract sufficient numbers of students in introductory courses in order to expand programs at the upper levels. Get them to enroll, provide a sufficiently entertaining and non-demanding experience to keep them there and water grading standards just enough to ward off a bad reputation. Besides, is not the true function of introductory courses from the department's view to discourage the unmotivated or unworthy from declaring a major in the field?

The most disturbing thing about this congenial interpretation of student disabilities was that I had never really considered or tested the other possibility. Could it be that the majority of students did not recognize a challenge they wanted to meet? For the first time in my academic career, I wondered whether the claim of certain scientists that anyone of ordinary intelligence could understand something of science might not apply to history also. This claim is born in part of a conviction that, unless the average citizen understand science or at least some of its implications, hope for a rational public politics is minimal. I hold an analogous opinion of the importance of history. I decided, therefore, to test the proposition that there might be a way to tap and enliven intellectual resources that had, heretofore, been well hidden.

How did I come to rearrange the pieces of teaching method? The answer has three parts. First, I had to put aside all the traditional tools and start from scratch. Second, I rethought objectives, about history, about courses, about student behavior. Third, I looked for a useable past.

The obvious thing to put aside in the traditional method was the lecture. It certainly is fashionable to do so. But why? A reconsideration on my own terms was called for. The result was that I concluded that the lecture as dominant mode for the conveyance of fact and of meaning is inefficient and, more disastrous still, it is largely ineffective. Most lectures I had as a student or delivered as a teacher were given over to conveying fact. It is patent that there are far more efficient means for relaying raw data to students. A mere repetition of the most important of them is a poor reinforcer and runs the risk of distorting history by reducing it to simplicities. Far too few lectures were effective in the sense that they defined a significant intellectual problem and resolved it insofar as the most pertinent facts admit of a solution. Few, in other words, transmit at a respectable level of intellectual difficulty the best of our cultural heritage from the perspective of the lecturer's discipline. Finally, even when lecturing is consistently exceptional in intellectual output, the question remains whether devoting ninety-five percent of classroom time to lecturing is an educationally effective use of that time. Even when the lecture is integrating, does it force the student to a personal confrontation with history's unlimited possibilities? My argument here, as I hope to make clear a little later, is not with the lecture as such. Rather, it is with its perversion in content and in place in the American public university.

Once having eliminated the lecture as predominant mode, the rest of the structure of my older courses fell of their own weight. The experience was painful and bewildering. But, what was most disorienting was considering the alternatives. There seemed to be only two. The one, the notion that mass public education and quality in introductory courses at least were incompatible, I had already rejected as depressing conjecture. The other equally insistent suggestion of a public sort was that the answer lay in doing away with structure altogether. Create a decent human environment; forget about standards and content; let the student affectively establish his own terms of quality. That answer was no more tolerable than the first. For me, openness of style and relaxation of standards must not be compatible. Nor is the elimination of external motivation -- coercion, if you will -- acceptable. If the issue is only between learning as miserable work and learning as fun or, to put it in the current jargon, between the cognitive and the affective, content and process, I will abandon the latter without qualm. Fortunately, as student behavior in my courses over the last two quarters has indicated, the issue was neither so dramatic nor so necessary as that.

The only way out of my dilemma was a fundamental reconsideration of what any course in history could possibly hope to achieve. What is teaching history all about? More important still, what can we expect of our students? And, how can we communicate our expectations to them in a way that promotes a confrontation with history that is both challenging and exciting?

When I began thinking through those questions the pieces of a new approach began to fit into place. The keystone was the realization that no course in history was or could be comprehensive. To insist that a working comprehension of the skeletal narrative of any slice of history is the goal almost inevitably distorts the instructor's presentation and the student's perception of what history consists of. Moreover, it renders practically hopeless the task of getting the student to make judgements about the significance of and relationships between disparate facts on his own. At best then, the typical survey course reinforces the student's belief that history is somehow mysterious, knowable only to those more worthy intellectually than he. The implication of my reconsideration is not that narrative or the development of factual knowledge has to be abandoned, only that it can no longer serve as the goal of the course. That goal, instead, becomes developing skills for analyzing historical problems. And the student has to be provided with an opportunity to use and so, to refine, those skills.

It also struck me that it is only fair to remind students that American history was no more relevant to them, ultimately, than courses about the history of exotic places and ancient times. In other words, my course, like any other, is concerned with man as a problem solver in, essentially, a timeless moral context. Neither the student nor the teacher should expect the course to do more than suggest a few of the ways in which problems, having some sort of public dimension, raised themselves for a given group of men at a given time and how men went about resolving or failing to resolve them. Relevance, in other words, is only a matter of personal identification. The student's task, at whatever level of intellectual sophistication, is to discover that identification.

Having defined a more modest task for my course in terms of material to be covered in depth, yet having placed on the course a much greater burden in terms of transmitting meaning, I was free to take a new look at the older method. Clearly, that tradition offered much that was useful for restructuring pedagogy.

Take, for instance, the lecture. For the first time, I was free to see its potential for the classroom. Thinking about the role of the lecturer in the great universities, I discovered two conditions for employing it in public education, especially at the introductory level. First, the good lecture does not attempt to convey fact. It is interpretative and integrative rather than narrative. As such, it is an excellent way to illustrate the process by which the historian confronts history. Like the historian's other professional work, the lecture is a form of argument -- thematic in raising important problems and in resolving them. And, it communicates an intellectual attitude which actively honors the rational in man and affirms his claim to a worthwhile culture.

The second condition is a recognition that in the great European and American universities the lecture is simply one of a number of resources for students. In those institutions, the classroom or lecture-hall is more incidental than central in the student's formal education. He is free to take advantage of the best lecturers; he will not be damaged much by the worst. Few examinations that I know of in those settings are geared to what lecturers say or, more precisely, to how they say it.

On these terms, I found that I could use the lecture less frequently but more effectively in the course. Each of the ten lectures I or guest lecturers presented were now freed of the burden of sounding like a textbook chapter. Instead, they could be developed as a serious confrontation with a single or related set of historical problems and at a level appropriate to the course taught. The students, for their part, were freed from the demoralizing responsibility of taking accurate notes on all that was said. They were free, if they chose, to become engaged with the lecturer in confronting history. At heart, then, the lecture became for me simply another resource for the student. And, he would take advantage of it only because he saw in it something of value. Stated another way, the expertise of the instructor must be demonstrated, not presumed.

Next I reconsidered the traditional seminar. It suggested the value of an open exchange of opinions and information among a limited number of students. Here was a testing ground for ideas. Further, the seminar suggested that the student was a critical resource for discussion itself. He is motivated to study sources outside the seminar because of what is basically peer-group pressure and his corresponding desire to contribute something to the group. At least within the peer group itself, a rough kind of equality exists. That is, the difference in sophistication and erudition between the brighter and less bright students is probably only marginal. Finally, by placing a premium on group projects, I hoped to enforce cooperative, if critical, rather than extreme anxiety-ridden relations among the members of each mini-seminar.

Reconsidered in this way, a modified seminar form seemed ideally suited to forcing students continually to articulate their opinions about the history or historical problems they have studied. And, modifying the seminar a bit more by reducing my role within each group to _ex officio_ status, one of the most severe educational handicaps facing many students in public higher education might also be overcome. For the first time, they would face equals, not supposed and intimidating authority, in a discussion situation. Perhaps they would find that their own ideas had merit after all. More hopefully, they would discover that their whole ego did not ride on an idea that was less tenable than someone else's. In short, they might realize that the merit of ideas was not a function of personality but of learned, analytical and argumentative tools. And, to the extent that inequalities of talent do exist, it might be that some students would teach others and, in turn, reinforce their own educational experience.

Having defined new roles for the lecture and the seminar, and for students, I still needed a technique to make the thing go. What were students to do and how was I to evaluate what they accomplished?

Two other methods with equally venerable and useful histories provided the answer. The case study method has been used with tremendous success in professional schools and, certainly, has a secure place in the pedagogical bag of historians. There is good reason for this success. The case study specifies a problem in detail, forces the student to play the role of decision-maker in a public way, forces him, moreover, to grapple with the problem on its own terms and through primary sources. Secondary sources, including the expertise of the instructor, may be utilized; at best, however, they suggest only possibilities or other modes of analysis. I opted for using the case study -- indeed a number of them in order to dip into various periods of American history and, thus, highlight particularly thorny and persistent problems endemic to our society.

The key to evaluating student performance was suggested when I took a look at the lab, a scientist's equivalent for the case study. Science teachers have insisted, to the bewilderment of many in the humanities and social sciences, that it is absolutely necessary that students conduct experiments, that they dissect, combine, bounce, mold in some way the subject under investigation. In other words, the assumption underlying the lab -- like the case study -- is that students come to knowledge as they strip away misperceptions and get to what is knowable by working directly with the substance of the discipline in a systematic way. The lab director specifies the method of experimentation -- the behavior which will lead the student to results that approximate reality. In the process, of course, the student develops rudimentary analytical techniques. The student's success in the lab can be evaluated rather easily in terms of the number of experiments he has conducted successfully and perceptively.

The analog for an evaluative technique in history occurred to me. The student's success in the course is a function of his ability to suggest a solution to a problem in history which is literate (written with due regard for the rules of grammar), logical (conclusions follow from premises) and plausible (both premises and conclusions fit the facts). These three ideas, then, form a grading standard, one that, if it is not entirely purged of personal interpretation, does at least approximate objectivity. Moreover it is realistic. The student's task, in short, is to convince.

Is the approach I have adopted valid? And, is it more effective in taping the intellectual resources of students and of more of them than the method I abandoned? The answers to these questions draw on a variety of sources: word from the undergraduate librarian on the uncommonly high use of reserved material, personal impressions, verbal testimony of students and a complete record of course documents, including a lengthy course evaluation form.

The general impression from all of this evidence is that the greater majority of students have found their confrontations with history challenging, exciting and worthwhile. At least seventy-five percent of the thirty-three members in the first class and so far somewhat over sixty percent of the forty-six students this quarter have worked at a consistently high level of involvement and attainment.

With rare exceptions, the students began the course with an indifference toward or even a fear of history, the product of banal, boring or otherwise bad experience with the subject in the past. For them, to be excited by history was a personal revelation. And, not once does the evidence suggest that the work was easy or that the demands placed on them in terms of quantity or quality were soft. Often the point is made in a log entry, sometimes in despair or condemnation, more often in a kind of glad astonishment, that never has the student worked so hard in a course.

A typical example of the work students have been willing to do was the response of last quarter's class to the study exercises and fact skill exam. Both were packed into the first two weeks of the course rather than broken down into units. In other words, beginning with the first day of class and for five days running, students received a set of questions to work out overnight and to come to some resolution about in their groups the next day. At the end of that time an objective examination of some one hundred and ten questions was administered. Proficiency was demonstrated with a score of 70 or better. The personal logs covering this week or so present an amazingly consistent picture: of forty-six students, at least ninety per cent of them worked more than two and a half to three hours a night digging through the text. Only two students failed to attain a qualifying score of seventy on an exam of moderate difficulty. Out of 110 points, seven students got marks in the '90's, twenty-seven in the '80's, ten in the '70's and two in the '60's. Few believed they could possibly "gut" a 500 page textbook; yet, the results of the examination seem to indicate that they did a fair job of doing just that.

Even more encouraging is the effective use of their groups nearly all the students have made both this and past quarters. Few indeed coasted on the work of others. Only four or five of the twenty-five groups so far have been unable to operate effectively on a consistent basis. Most students have found that the groups were a useful device for trading and testing ideas, seeing whether their answers were plausible. Quite a number discovered that when they found some questions particularly resistant, other group members had resolved them convincingly and vice versa. From my perspective, the sight and sound of students in an introductory course engaging one another in debate about the fine points of history warmed the soul and vindicated my faith in them.

The experience with the case studies has been interesting and instructive. Work in class has usually been hard and conscientious. But a kind of cyclical pattern in enthusiasm and involvement established itself in the first quarter and has been consistent over the last two quarters, in spite of variations in course design. Great excitement and interaction characterizes the work of the groups for about three weeks. Then, a tendency toward drawing back and letting others pick up slack sets in, replaced finally by renewed enthusiasm toward the end. As a counter measure I have taken to setting aside a class period which is devoted to open discussion for the course and my hopes for it and for the students. The practice has a good effect, especially in reminding students about the objectives of a course in which they have the lion's share of the burden for discovery.

Disappointment in the level of work exhibited in a number of case study papers last quarter, repeated again this term, led me to adopt a strategy quite in keeping with learning theory and, in fact, with common graduate school practice. Interestingly, the finished products of the first quarter's class, with few exceptions, met my published standards for the grade of B -- consistently so from the second paper on. Yet, last quarter and this, many of the papers have not been that solid. Why the first class of randomly selected freshmen should have turned in better papers than last quarter's sophomores and junior class or this quarter's freshman class is a bit of a mystery. At any rate, I began to turn back, with literary and substantive criticisms, papers I considered below honors level. This quarter, I made it clear in the syllabus that papers could be resubmitted as many times as a student wished without penalty. The last grade the paper received would be recorded.

The result has been salutory. Papers have been worked up from the mediocre to the exceptional. Students have learned something about fashioning a public idea -- literately, logically and plausibly. Knowing that they need not fail, they have been resourceful, energetic and often imaginative in defining, analyzing and resolving historical problems.

As I look back over student reactions and behaviors so far, a number of still random impressions stand out. For one, the relief that mine would not be a lecture course was nearly universal. (This was typically expressed before I had presented my first lecture.) Closely allied to this feeling was the opinion, expressed in a non-coercive situation, that the case studies were much more valuable as a way of understanding the timelessness of man's decision-making dilemmas than the standard lecture and secondary source approach.

It is also my impression that nearly all of these students can express themselves in writing fairly well. That is, given the informal guidelines for the personal logs, students communicate effectively and, for the most part, with surprising grammatical facility. They use the vocabulary and phraseology they are comfortable with. They are direct. Most of the time, they write in straightforward declarative sentences. The challenge I have is to figure out a transfer technique. That is, I must get them to resist the temptation to resort to an unfamiliar jargon and a highly stylized phraseology when it comes to writing formal papers. If the group papers are any measure, my constant reminders to them on this point may have some effect.

Another impression is not nearly so random. It is, in fact, a conviction. The objectives sought in the course must be made perfectly clear to the student at the outset. If possible, something of the instructor's personal orientation toward material and pedagogy ought also to be spelled out. In other words, the student has a right to know precisely what is expected of him, how he will know if he is or is not doing well and how he can improve his performance. The evaluation forms filled out by the first class are unanimous in their appreciation of the specificity with which my forty-page syllabus states objectives, course organization, grading standards, and schedule and, further, states something of my own approach to history and its values. The syllabus does not tell them that the course is a breeze. Quite the contrary. The students all realize that they will work hard. What they do believe is that the course offers them an interesting opportunity to look at some aspects of history, to use their own intelligence and to succeed. The syllabus is my contract to them. On that basis, they'll sign up and work like hell.

Finally, let me try to anticipate possible points of critical inquiry. Isn't my course only really catering to the current demand for the affective? Surely the affective plays a role in my classroom. But its utility can easily be overlooked. What the group method does foremost is to establish a behavioral reward system that is patently lacking in the passive lecture mode. It simply will not do to argue that students, by and large, lack motivation. Students are shrewder than we know. They conserve energy in order to expend it on what they regard as rewarding experiences. Because we do not, in public institutions, have the run of highly selected students who are convinced already that the most rewarding experiences are those of the mind, we have a far greater responsibility than Harvard professors for example to create exciting classroom environments. So far, my students have seen in the group approach, after some initial scepticism, not a chance to hide again, but to work through some potentially interesting problems with others of similar skills.

What is it then that I can certify about the students? Are they better people for having taken the course? I am not prepared, anymore than you are, to say that about my students. That is beyond my professional and personal competence. I only certify what I am able to observe in the classroom and am given, in my professional capacity, to evaluate. In that case, are the students better students as a result of the course? Do they know more about American history because they took my course rather than another? Frankness compels me to admit that I really don't know whether, six months or a year after the course, my students will retain any more of the facts of history than any other group of students. I would not be at all surprised, however, if they retained a fuller grasp of the factual setting of the five case studies. Still I do not regard that as much of a test, if only because, as an historian, I retain for ready recall only what I use year after year. However, to the extent that logs and evaluations are reliable, it appears that most of my students have developed an appreciation for history. And, I am persuaded that on the average my students will have learned and retained many more of the techniques for investigating, analyzing and resolving historical problems than students trained in other surveys. Seventy-five percent of them will come out of my course with a fair start along the road of intelligent problem-solving. Now, that to me is much more meaningful a measure of success.

Which brings me back to my personal teaching credo. Let me restate it in the broadest possible terms, thus returning to my opening premises. I think it is incumbent upon public higher education to provide educational opportunities on a grand scale -- as grand indeed as is necessary to man this highly bureaucratized, technological society. Bring them in by the score. Then, let us do something creative with their experience. Let us introduce them to the excitement and challenges of the intellect. What is incumbent upon us, in other words, is to ensure that the quality of public higher education is not diluted. The easiest way to fail is to insist that the task is impossible or that only if we get motivated students or only if we get more money can we do anything. Do what? Reduce the student/teacher ratio from 30 to 1 to 15 to 1? Forget it! We are not about to enjoy that luxury again. The point is that we are not a high priesthood, guarding the sacred treasure of knowledge from the ravages of the uninitiated, but a service profession whose aim it is to direct our students to the challenges and rewards of intellectual experience.

We cannot afford the luxury of reaching only the motivated thirty percent. For the most part, like students at the private schools, they do not really need us. Indeed, the Ivy League models are singularly inappropriate to our responsibility. That obligation is to stimulate, goad or even trick the other seventy percent, who come to us already conditioned to think they have nothing to contribute. To get to them means we must be willing to reexamine the nature of the classroom experience. It is, I submit, our success or failure to awaken the intellects of this truly hidden majority in our classrooms that will determine in a measure beyond our calculation the possibility for a rational public politics in the future.

ON TEACHING IN THE UNIVERSITY: A RESPONSE

Carl Semmelroth *

Professor Buhl has raised a number of important and interesting issues concerning the goals of a University education, the learning process, and the implications of these things for the design of course instruction. In response to his paper I will address myself to two aspects of what he has said, and then, taking advantage of the prerogatives of a respondent, I will initiate a small polemic of my own. First, I'd like to say a few things about why I believe the design of the History course which he describes is an excellent design. Second, I'll say why I think that he has done the right thing for the wrong reasons. That is, although I like the course he designed, I don't agree with what he says about it.

First then, why is Professor Buhl's course design a good one? I propose the following criteria for making that judgment. In order for a course to be a good one, the instructor should know something, i.e., he should have something to teach. Although this prerequisite is probably the most important single requirement for effective formal education, it is often considered frivolous to talk about it seriously. The criteria of mastery of a subject matter area for purposes of teaching in that area should be no less stringent than those criteria used for hiring a researcher in that area. Also, just as individuals vary in their degree of subject matter competence, different disciplines and areas within disciplines vary with respect to how much is known. Thus an instructor may fail to meet our first criterion for teaching an effective course either because he is poorly trained in the subject matter, or because the subject matter simply doesn't exist. In the present case, I think we can safely assume that American History since 1865 does exist, and that Harvard University effectively implanted that subject matter into the

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repertoire of the instructor of History 112. I hesitate to give counter examples at the University for obvious reasons, but it doesn't seem to me to make sense to create a formal institution of learning, at great expense, and then offer courses in subject matter areas where the students are likely to know as much as the instructor.

A second criterion for an effective course is to ask whether the students are told in a helpful way what they are expected to learn, and how they are expected to learn it. Jim Bouton in his book, "Ball Four", had some rather succinct things to say about pitching coaches in major league baseball who's major teaching technique is to say "ata boy baby" when you threw strikes and "you should never throw that pitch in that situation" when he threw gopher balls. An exception was Johnny Sain who has a theory of pitching, tells his pitchers what it is and helps them experiment with it. Well, I would suggest that Professor Buhl is the Johnny Sain of History 112. Perhaps he will not produce an Early Wynn or a Denny McLain, but I suspect that his students find it a lot easier to learn history because he has told them what to learn and given them "do-able" tasks to help them learn it. Giving students "do-able" tasks from which they learn is probably the best way to describe the so-called new educational technology, e.g., programmed instruction. As Professor Buhl has demonstrated in his history course, giving students "do-able" tasks does not require a "teaching machine", nor must the tasks be ridiculously simple. They must be merely "do-able".

Examples of tasks which are not "do-able" by students and from which it is very difficult for them to learn are: "To prepare for a mid-term on Chapters 1-10 and everything in the first 5 weeks of lecture." or "To form a group and design a psychological experiment." In short, it's just a lot easier for students to learn something if we tell them as well as we can what they are expected to do in order to learn it.

Another criterion for a well designed course is: Are the students told in a helpful way how their performance is to be evaluated? Professor Buhl has designed a rather ingenious grading system in which students are "paid off" for the quality of products to which they contribute but where that pay-off is adjusted according to the quantity of their contribution to the product. This grading scheme is one which I suspect does a good job of informing the student about what is expected of him.

My reaction, then, to the course design which he has described is that it is an excellent one because (1) it has a known subject matter, (2) the instructor knows this subject matter, (3) the students are told in a helpful way what they need to learn, (4) the students are given "do-able" tasks which help them learn, and (5) the students are told in a helpful way how their performance is to be evaluated.

Now, my reaction to what he says about his course and about higher education in general. Professor Buhl has said that a meaningful measure of the success of his course is the number of students who leave the course having been trained better in intelligent problem solving. This criterion for success grows out of his statements of the value and function of higher education -- namely, "the challenge is ... to educate more resourceful people, people who are skilled in problem-solving of a general sort and who above all, have have developed skills appropriate to understanding and affirming the best of our cultural heritage."

I neither think that the goal of education is to train people in "a general sort" of problem solving, nor do I think Professor Buhl's course does this. Good education certainly does help people solve problems, but not because it teaches them problem solving, but because it teaches them information and skills necessary to the solution of problems. The cultural heritage, which Professor Buhl would like students to understand and affirm, consists in large measure, of a recognition that knowledge is good, that it is worthwhile to learn. The reason it's good to know, rather than be ignorant, is that knowledge enables us to solve problems that we could not otherwise solve regardless of how clever we are or how good we are at "problem-solving" in general. In short, I don't believe that Professor Buhl is teaching his students resourcefulness; however, I do believe that he is teaching them content which may very well be of use to them in the solution of problems they will face.

Professor Buhl has a rather low opinion of lectures used to transmit information and the instructor as an authority which I don't share. I don't think there is anything intrinsic about lecturing, as a method of teaching, which makes it a poor way to transmit information. I experienced a lot of poor teaching, both lecturing and otherwise as a student just as he did, but the lectures were poor because the instructor didn't bother to tell us what we were expected to learn from him, or what questions he was answering. I also experienced good lecture courses, which did transmit information. In fact, probably the best undergraduate instructor that I had taught statistics by lecturing. Of course, he didn't teach statistics very long; they made him an Assistant Dean.

As for the instructor as an authority, the term "authority" has several definitions. One is "the right to control, command, or determine." Another can be transmitted without authorities in the sense that they are "accepted sources of information." Surely we cannot expect every student to research again all physics and chemistry or, perhaps more to the point, historical events. Thus it would seem that the instructor should be an authority in the sense that the student can depend on him as a source of information.

As for the instructor as an authority in the sense of having the right to control, I suspect that Professor Buhl controls the behavior of the students in his history course quite effectively. In fact he has told us that his grading system and log book requirements were consciously designed to produce particular student behaviors. Perhaps his objection, then, is to the instructor as a punishing authority, in which case I agree. There are many problems with the use of punishment as a method of regulating or controlling behavior aside from just ethical considerations. Its biggest problem is that the use of punishment makes avoidance behaviors reinforcing. Unfortunately, or fortunately, depending on your point of view, the student has other ways to avoid punishment in a course aside from the behavior of learning, for example, cheating, not going to class, dropping the class or dropping out of school. But the solution is not to stop trying to control the students' learning, but rather to control it better. One way of doing this is to design courses where the student can be reinforced for learning rather than punished for not learning and I think Professor Buhl has done this.

And now my polemic. What is needed to improve the quality of instruction in the University is not so much the application of new methods of instruction or innovative teaching. Rather we need innovative methods in the care and feeding of instructors. I would maintain that the necessary ingredients of good instruction are obvious to any professor who sits down and tries to design a course. There is probably no professor at this University who doesn't agree that it's more effective to tell students what they are expected to learn than it is to throw a lot of material at the students and then reward the students who learned certain parts of the material and punish those who didn't. And yet, many, if not most, of the courses which I experienced as an undergraduate, and I suspect many of the courses at this university, were nothing more than a reading list and a set of exams. This doesn't mean that I didn't learn anything. But, we don't need most of the faculty and most of the physical plant of the university in order to educate students in this manner. All we need is the library and a set of exams over various subject matter areas.

If it is true, as I have maintained, that the ingredients of good course design are quite simple and in fact are well known to all instructors, then the question arises: Why aren't the courses uniformly much better?

I think there are several possible answers to this question. Let me illustrate by giving you an only slightly apocryphal case history.

Mr. Jones, who was in the latter stages of his Ph.D. training, was given a teaching fellowship which involved total responsibility for a course in his area of interest. Because he intended to join the academy after graduation, and make his living teaching, he was particularly excited about this opportunity. Mr. Jones had also given some thought to why he had been less than satisfied with many of his university courses and was determined to do better. He had learned to get good grades in school, and at the same learn something, however, it seemed to him that much of the effort required to get good grades had very little to do with learning. Much of it was spent on outguessing his professors and fellow students. He had been around long enough to suspect that one of the reasons why he had to guess what to study and learn for exams was that many of his instructors didn't know what they were going to put on the exams until two days before the exams. He was determined to avoid this and other problems so that his students could devote their energies entirely to learning course material rather than coursemanship. He had some time during the summer to think about the design of his course and a series of exam questions covering the material he wanted the students to learn. Come September, he opened his first class by handing out his carefully written syllabus containing course objectives and series of exam questions and told his students that he was there to help them learn the material. Things went well for the first week or so; the students were attentive, they came to class, they asked relevant questions and Mr. Jones really felt like a college professor. He gave the first exam and the results were phenomenally good. Thirty-five of his forty students had received 90% or better. As the quarter went on he continued to get good exam papers but he began to feel a little uncomfortable. First he began to worry about grades. His tests just weren't discriminating very well among the students. Furthermore, his students weren't acting very attentive in class. Their questions were still relevant; that wasn't the problem. It was just that they didn't look like they were paying attention and furthermore attendance wasn't very good. In short, the students had stopped behaving toward him as if he were a professor. The biggest problem he had was that he could see that they were going much faster than he expected and he would have to add some more material to the course. He decided to add a required term paper. The day he announced the paper and described the various options involved with it was the best he'd had in several weeks. The students perked up, looked attentive, several came up afterward and talked and he again felt like a professor. The papers turned out to be quite uneven in quality and his grading problem was solved. Furthermore, he found that when he talked to other teaching fellows about some of the lousy papers his students had written they seemed interested and told him about some of their own experiences whereas earlier when he had attempted to tell them about how well his class was doing, they didn't seem much interested.

The following quarter Mr. Jones was given another course to teach. He didn't have very much time to prepare for it, so he was forced to prepare pretty much week by week. He still attempted to tell the students ahead of time what was going to be on the exams, but he found this to be a difficult task week by week. He became increasingly reluctant to tell his students what his hastily prepared questions were because the students seemed to be looking for a rote answer to memorize and put on the exams. He therefore adopted the technique of talking in general about what was to be on exams. This seemed to work better and furthermore attendance and student interest went up dramatically. Three years later Dr. Jones is an assistant professor at a large mid-western university. He teaches principally by lecturing with a required text, a mid-term and a final exam plus two short papers. He has a student, a Mr. Smith, who is thinking about going to graduate school and becoming a college professor because he is quite dissatisfied with the amount of effort he must spend out-guessing his instructors and other students to get good grades and he thinks he could do much better than Professor Jones.

My point is that the problem of improving instruction in the university is not one of finding innovative teaching methods. The problem is to find innovative methods of making the use of effective teaching methods desirable and rewarding for ourselves so that we will use the methods already available.

In summary, although I don't agree with everything Professor Buhl has said about the goals and methods of teaching, I do think that the History course which he has designed takes into account very well the ingredients needed for effective teaching. However, I suggest that the major challenge is to make whatever changes are necessary so that the consequences to ourselves for effective teaching methods are more desirable than the consequences for the use of ineffective teaching methods. If we can do that, someone else will not need to do it for us.

A SYSTEMATIC APPROACH TO TEACHING SECONDARY UNDERGRADUATE METHODS

Robert E. MacNaughton *
Richard J. McArdle +

A new College of Education in a new university seems the proper place for an innovative approach to the perennial problems that surround the pre-service, secondary methods course offerings. The problems are legion. Some of the more frequently articulated include: the criticism that theory is separate from the real world of the secondary school; the criticism that there is an instructional emphasis on unsupported generalization rather than development of specific skills and competencies; alienation of liberal arts faculty in course planning; and failure to adequately involve secondary school teachers in planning for the related field experience portion of these courses. With these in mind, and after numerous conferences among College of Education faculty, liberal arts college chairmen and public school personnel, a new course, Education EDS 300, Curriculum and Methods, was launched.

The new course brings together those concerned with what to teach and those concerned with how to teach, in an attempt to produce a better prepared teacher. It tries to do this in part in the real atmosphere of the public school classroom with the assistance of an experienced teacher.

The basic principles guiding the new course are as follows:

That preparation of teachers should be a team effort involving academic specialists, experts in classroom procedures, and classroom teachers in the field.

That performance criteria for the methods students should be established and that a systematic design be drawn to enable the students to attain these criteria.

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In keeping with these principles, the following course objectives were established to enable the prospective teacher:

1. To develop an appropriate concept of his discipline.
2. To select what should be taught in his area of specialization and develop a rationale for this.
3. To select and state behaviorally appropriate instructional objectives to give direction to his teaching.
4. To systematically plan procedures for carrying out his stated objectives.
5. To practice various teaching strategies.
6. To develop and test out a theoretical base for maintaining the learning environment.
7. To analyze the verbal and non-verbal aspects of the teaching act in general and apply this analysis to his own teaching behavior.
8. To identify and explain specific, recent innovations in education.
9. To practice implementing specific instructional objectives.

In order to implement these objectives, each one was analyzed, breaking it into "tasks" which the student needed to accomplish. For each task, learning activities were identified which were needed to provide the required skill, knowledge, etc., to accomplish the task. Finally, a performance standard was chosen which would indicate that the student had successfully completed the objectives.

The following is an example of breaking an objective into tasks, learning activities, and performance standards.

Objective #3 - To select and state behaviorally appropriate instructional objectives to give direction to his teaching.

Items "A" through "E" illustrate the tasks to accomplish Objective #3.

A. The learner must be able to distinguish between broad educational objectives and instructional objectives.

B. The learner must be able to distinguish between instructional objectives which are behaviorally stated and those that are not.

C. The learner must be able to identify the domain of a given objective as belonging to the lowest or higher than lowest level of cognition.

D. The learner must be able to classify cognitive objectives as belonging to the lowest or higher than lowest level of cognition.

E. The learner must be able to write objectives in each of the three domains and indicate the level of the cognitive objectives.

Some learning activities for tasks A-E include:

> Reading programmed text on behavioral objectives, viewing film strips on behavioral objectives (optional), participating in small and large group discussions, and conferring with instructors.

The performance standard consists of a three-part written test in which the student must identify a list of 20 objectives as behavioral or not (minimal: 18 right); identify the primary domains of 10 objectives (minimal: 9 right); identify level of 10 cognitive objectives, indicating whether the objective is of the lowest level or higher than lowest (minimal: 10 right).

Course Components and Scheduling

In order to achieve the objectives, the course is divided into four basic components, two theory and two practice-centered. In one of the theoretical components, students are grouped without regard to their area of academic concentration. This component emphasizes the pedagogical, such as stating objectives, planning lessons, analyzing teaching, managing the classroom, etc.

The second theoretical component concentrates on the student's specialty and emphasizes content. A subject matter specialist from the College of Education, a representative of the appropriate academic department, or possibly both, usually conduct this component.

The two practice-centered components are divided between actual field experience in selected schools and simulated laboratory experience on campus. The field experience consists of regular, specified group experiences, each with a specific performance objective developed cooperatively between the University and representatives from the schools involved.

Some examples of these field experience objectives are as follows. The student will:

(1) describe the school community and indicate the impact on the school program.

(2) identify a variety of teaching techniques and teacher behaviors and observe as many examples of these as possible.

(3) identify and evaluate various means of attaining effective classroom control and management routines.

(4) analyze and evaluate the role expectation of a teacher in a classroom and in the total school bureaucracy.

(5) practice establishing instructional objectives, assess the readiness of learners to attain these objectives, and plan to teach a lesson to an individual or group of learners to attain these objectives.

The simulated laboratory experience consists of many activities, such as micro-teaching, programming, simulation gaming, tutoring, etc.

Various time arrangements have been tried for this course, but at present students register for eight quarter hours of credit, blocking out two hours every morning for the ten-week quarter. The ten weeks are divided into blocks of time for each of the components. The theoretical components are divided equally between pedagogical and content-oriented methods. The practical components consist of two weeks of concentrated experiences in a cooperative school and four weeks of simulated laboratory experiences on campus.

Effects

Judged by the standard of the degree to which students who take Curriculum and Methods can meet the performance criteria, the course has been successful. A majority of the students can state objectives behaviorally, can play systematically for their attainment, and can meet the other performance standards. In addition, every student has an opportunity to rate the course, and the tabulations over the quarter are generally positive. The real issue, however, is the extent to which the course objectives produce students who possess competencies which will enable them, as secondary classroom teachers, to facilitate their pupils' learning. On this much evidence is still out. However, the results to date have led to a desire on the part of the faculty in the Department of Secondary Education to further revise the undergraduate professional curriculum. For the past year a committee has been studying the problem with the resulting recommendations: to enlarge the time block for the course by merging the Evaluation and Measurement course, triple the field experience time, provide for various alternatives (programming, gaming, open classroom, etc.), and further individualize instruction through development of learning packets.

Conclusion

The course has not been without its problems. Chief among them has been the coordination of syllabi and continuously changing time and space allotments. True coordination requires that faculty members communicate within and across departmental and institutional lines. It has not been easy, and placing the entire curriculum in such an arrangement will certainly increase the problem. The faculty has, however, committed itself to this direction; and it is not likely that it would be satisfied to return to the old arrangements, even if at times it seems the simplest thing to do. Continuing favorable reports from student questionnaires, as well as favorable reports on student teachers in the field, help to support the conviction that we are moving in the right direction.

A SYSTEM FOR PROGRAMMING INSTRUCTIONAL DIALOGUES ON A SMALL COMPUTER

Phillip L. Emerson *

A system is in operation whereby a teacher may compose a sequence of lessons to be stored on computer tape and administered automatically to a student via a teletype terminal. The system is highly flexible in that the capacity for branching and cycling within a lesson sequence, depending on the student's responses, is almost unlimited. Also, the lesson author is provided with almost the full capacity of a powerful text manipulation language, SNOBOL, for making transformations and tests on the student's responses. An additional important feature is that the lesson author may provide a glossary of information which the system then uses to answer questions that the student may ask during a lesson. The system can accommodate variations in the style of lesson composition to take the best advantage of the particular combination of memory size and mass storage device.

INTRODUCTION

We describe here the main functions of a set of programs for writing and automatically executing a sequence of dialogues or lessons. Such a system could probably be implemented on many of the various models of minicomputers (Sidowski, 1971) which are now available. However, some form of mass storage device, interfaced to the computer, is an essential part of the hardware system. The style of the lesson programming examples here tends to reflect our hardware configuration, which is an 8K PDP-9 with three DEC tape drives, but variations of style are discussed that

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would be appropriate for systems with more or less core memory, and with other mass storage devices such as disk or drum.

The fundamentals of the course author language are explicated and exemplified in order to convey a taste of its flexibility and simplicity. It is founded on the SNOBOL language, and particularly on an early version (Farber, et al., 1964). Although there are now later versions (Farber, et al., 1966; Forte, 1967; Griswold, et al., 1968), the earlier one was most feasible for a small computer.

ORGANIZATION OF A LESSON SEQUENCE

A course of instruction consists of a sequence of lessons which are written into files on the mass storage device by means of the normal alphanumeric source program input device, a teletype in our case. The number of lessons in a course and the lengths of the lessons are variable according to the subject matter and the particular objectives of the sequence. A lesson is divided into a sequence of sections, each section consisting of a sequence of lines on a teletype. The length of a section is the main stylistic variable whereby the best advantage may be taken of the particular hardware system. During the execution of a sequence, a single section resides in core memory at any given time. Thus, conditional branching and cycling within a section may be done freely. Branching and cycling between sections are also possible, but they involve searching through the lesson file on the mass storage device, which may mean significant delays in execution unless the device is a disk or a drum. In addition to the lesson files, the course author may optionally provide a glossary file containing terms, definitions, explanations, examples, and the like, to be used in response to questions from the student during the execution of a lesson.

The Lesson File. The largest self-contained unit is a lesson whose length is usually determined by constraints on the duration of a student session, and convenient divisions of the subject matter.

The Glossary File Name. The first line in the lesson file contains only the name of the glossary file to be used in answering questions. This name should be started at the left margin. If the author chooses not to provide a glossary, this line is necessary anyway, and a dummy name should be supplied.

Section Numbers. The sections in the lesson file are separated by section numbers prefixed by the number sign, #, on the left margin. The sections should be numbered in increasing order, but not necessarily consecutively. We usually start by using the sequence of section numbers, #5, #10, #15, etc., so that gaps are left for the possible insertion of new sections if the lesson is edited later. Nothing else should appear on the same line with a section number. After the last section in a lesson, an additional dummy section number should be included as the last line in the file.

Section Lines. The executable part of the lesson consists of the sequences of lines within sections. These lines are for the most part statements in the SNOBOL language.

SNOBOL is a language for the storage, retrieval, and manipulation of strings of alphanumeric characters. A SNOBOL statement consists of three parts: (1) A label, (2) a rule, (3) a goto. The rule is the executable part whereby string manipulations are performed and tests are made. The goto provides a way of conditionally branching out of the normal sequence of execution which is the sequence in which the statements are written. The label of a statement acts as its address which may be specified as the destination of a branch via the goto of some other statement.

In SNOBOL rules, strings of characters may be created, stored, retrieved, manipulated, and tested. Storage and retrieval ordinarily are performed by the use of string names. The other operations may involve reference to strings by their names, or by the specification of the literal contents of strings. Rules may be classified by the operations performed, and there are three main kinds. They are: (1) formation rules, (2) pattern matching rules, and (3) replacement rules. The formation rule simply creates a strong with a specified name, giving it specified contents.

An example is

```
X = '123'
```

This rule when executed forms a string named X with the contents, 123. Apostrophes are used to specify the literal contents of a string. The string named X will now contain 123 until some other rule is executed giving X some different contents. Thus, a formation rule defines a string name and also implicitly performs a storage operation. The contents of X can be retrieved and examined later merely by mentioning the name

X in a SNOBOL rule.

The pattern matching rule provides a way of examining the contents of a named string, and making tests thereon. It formally resembles a formation rule, but without the equals sign. An example is

X '23'

This rule causes the contents of X to be scanned for an occurrence of the substring, 23. A pattern matching rule is said to succeed or fail according to whether or not an occurrence of the specified pattern was found on the scanned string. The above rule would succeed if X were previously defined by the formation rule above, since the string, 123, contains the substring, 23. The success or failure of a pattern matching rule can be used for conditional branching by means of the goto of the statement as indicated below.

The replacement rule combines the pattern matching rule and the formation rule to permit the scanning of a string for a specified pattern and the substitution of something else for the pattern in the second string, all in one operation. For example,

X '23' = '4'

causes the contents of the string named X to be scanned for an occurrence of the substring, 23. If successful, the string, 4, would be substituted for 23. For X initially having the contents, 123, the result of the execution of this replacement rule would be that X would now have the contents, 14.

These three kinds of rules provide a flexible and powerful basis for all kinds of string operations. Other features of SNOBOL significantly augment this power and flexibility, notably, string variables, arithmetic, and indirect referencing (Farber, et al., 1964). However, we may proceed to see how labels, rules and gotos are combined into statements.

The label is the first part of the statement, the rule the second, and the goto the third. The label is some string of alphanumeric characters. It should be typed starting at the left margin. The label is optional if there is to be no transfer to the statement from some statement other than the immediately preceding one. If a statement has no label it should begin with a space or tab.

The label, rule, and goto are on the same line, separated by spaces or tabs. The goto begins with a slash, and the remaining part takes a form depending on the desired conditions of branching. The unconditional goto consists of a slash followed by a set of parentheses enclosing a specification of the label of the statement to be executed next. For example,

```
/(3)      /(7)      /(START)
```

are unconditional gotos. A conditional goto is similar, but either the symbol S or F occurs before the leading parenthesis to specify a transfer only on success or failure, respectively, of the pattern match in the rule of the statement. Both cases may be specified. For example,

```
/F(3)      /S(7)      /F(7)S(START)
```

are conditional gotos. A simple application of these features is in writing a statement to substitute spaces for hyphens on the string named LINE.

```
SUBS LINE '_' = ' ' /S(SUBS)
```

The statement label is SUBS. The rule causes the contents of LINE to be scanned for an occurrence of a hyphen. If one is found, a space (specified by the space between the two apostrophes to the right of the equals sign) is substituted for it and the rule succeeds. In that case, control transfers to the same statement to be executed again. This goes on until there are no more hyphens in the contents of LINE, and control then passes to the next statement in the program. Lines beginning with an asterisk are comments. They are ignored in execution and are useful only for the humans who read the program listing.

The course author language is based on SNOBOL but it has some other features that are not part of SNOBOL. The input and output commands, for example are not of the conventional SNOBOL kind. To have "THE QUICK BROWN FOX" typed on the teletype, the course author uses the special symbol, T:, in a rule in the following way

```
T:  'THE QUICK BROWN FOX'
```

To read a student's response from the keyboard into the special string, R:, the special symbol, S:, is used in a statement as illustrated in the examples below.

Aside from these differences, the other main one is that the statement labels are restricted to numerical positive integers. A transfer may be made via a goto to any numbered statement only in the current section, but to any different section (to the first statement in it) by using the number sign and section number in the goto. Also, there are some special system routines that may be transferred to by placing their names in a goto. They will be illustrated below.

Most of the features are illustrated in the following short section in a lesson

```
          .

          .

          .

     #40

          T:  'WHEN DID BEKESY WIN A NOBEL PRIZE?'

     1    S:

          R:  '?' " /S(ASK)

          R:  '1961' /F(3)

     2    T:  'THAT IS CORRECT.' /(NEXT)

     3    R:  'NINETEEN SIXTY ONE' /S(2)

          T:  'IN WHAT YEAR?' /(1)

     #45

          .

          .

          .
```

Putting NEXT into a goto as in line number 2 above, causes a transfer to the next section which would be #45 in this case. Line number 1 causes a line to be read from the keyboard into the string, R:. The line after line number 1 is a test of whether or not the response ends with a question mark. If so, control is transferred to the system routine, ASK, which looks in the glossary file for an entry term identical to the part of the response preceding the question mark.

This example does not illustrate particularly good programming practice. It treats as correct any string containing "1961" or "nineteen sixty one" as a substring, which clearly includes such response as "not in 1961", etc. The tests on the response string can be made more extensive to test for a number of likely paraphrases of the correct answer, and to test for various incorrect answers with appropriate guidance toward a correct answer. Some improvements are made in the following revision of the section in the above example.

```
         .

         .

         .

 #40

      TRY = '1'

      T:  'WHEN DID BEKESY WIN A NOBEL PRIZE?'

   1  S:

      R:  '?' " /S(ASK)

   2  R: '_' = ' ' /S(2)

   3  R: ' ' = ' ' /S(3)

      R:  'NOT' /F(4)

      T:  'PLEASE ANSWER AS SIMPLY AS POSSIBLE.'  /(1)

   4  R:  '1961' /F(5)

   6  T:  'CORRECT!' / (NEXT)

   5  R:  'NINETEEN SIXTY ONE' /S(6)

      R:  'NINETEEN HUNDRED AND SIXTY ONE' /S(6)

      R:  'NINETEEN HUNDRED SIXTY ONE' /S(6)

      TRY  '1' /F(8)
```

```
    T:  'IN WHAT YEAR?'
    TRY = '2' /(1)
8   T:  'IN 1961 BEKESY WON THE NOBEL PRIZE'
    T:  'IN PHYSIOLOGY AND MEDICINE.' /(NEXT)
#45
    .
    .
    .
```

Here the same question is asked, but lines 2 and 3 reduce the response to a more standard form by substituting spaces for hyphens and single spaces for multiple spaces. The line after 3 tests for negation, and the student is asked to rephrase his answer if it contained the word, "not". Lines 4, 5, and the three following 5 test for five variants of the correct answer. Then a test is made for whether or not the present incorrect answer is the first or second one given. If it is the first, the student is prompted, "in what year?" and given another chance to answer. If he is wrong a second time, the transfer is to line 8, where he is given the correct answer. Another improvement could be made by changing the goto, /(NEXT), in line 6, to /(#50), and then writing in section #45 the same question in a slightly different form. Thus, #45 would be skipped if the student gave the correct answer in #40. The tests for variant forms of the correct answer at line 5 and the two following lines could be made more easily, essentially in a single statement, by the use of string variables, a feature of SNOBOL that we have not discussed here.

The system reads a full section into core memory from the mass storage device, and then executes it. It then reads in another section, overlaying the last, and executes it. The program lines of the preceding section are lost when overlayed, but the contents of any strings defined by the execution of the preceding section are not. Thus, in the last example above, the strings, TRY and R: would still have the contents last given them in #40, after transfer to the next section. The string preservation feature permits a more or less connected dialogue to extend over several sections even though the amount of core memory available limits the lengths of the sections. This feature, together with the capability of branching out of the section sequence, is the basis of a capacity for a tradeoff between core memory size and the speed of the mass storage device, to maximize the efficiency of execution.

The Last Section in a Lesson. The last section may inform the student that the lesson is ended, congratulate him for finishing, and inform him as to the file name and general subject matter of the next lesson. It may also suggest something for him to read before starting the next lesson.

The Glossary File. The transfer to ASK, as seen in the gotos of the examples above, actually causes a transfer to a system routine which searches through the glossary file provided by the author. The same glossary might be used for a whole course of lessons, but an interesting option is to use a different glossary for each lesson in a sequence, where the successive glossaries become more refined or technical. They might be made to correspond to a sequence of models of the student's cognitive structure of the subject matter as he progresses through the lessons. For example, in a course on statistics starting at an elementary level, the entry for "distribution" for an early lesson might simply describe and give an example of a frequency distribution. For a later lesson, the same term might be the key to an entry which classifies distribution as empirical frequency distributions and theoretical probability distributions, defining several common forms, of the latter.

The structure of the glossary file is as follows. It consists of a sequence of entries, each consisting of one or more lines, with successive entries separated by a line containing nothing but an asterisk on the left margin. In general, an entry consists of a term followed by a colon, followed by the body. The term is the lexical key to the entry, i.e., the part that the system attempts to match with the significant part of the student's query (the query term). There are two kinds of entries, direct and indirect. The indirect entry is distinguished by the fact that the first part of its body is the string, "SEE", which is then followed by the referent term which is a term for some other entry called the "referent". An indirect entry consists of only one line. The body of a direct entry may occupy the remainder of the first line and usually several more lines of text defining the term, giving examples, etc. The only strict requirement on the order of the entries in the glossary file is that indirect entries must precede their referents. This is necessary because the system searches from beginning to end starting with a query term. When it encounters an indirect entry whose term matches the query term, it replaces the query term with the referent term and continues the search, etc., until either a direct entry term is matched or the end of the file is reached. If a direct entry term is not matched, that whole entry is displayed to the student. If not, an appropriate message is printed. In either case, control is then passed back to the beginning of the section in which the student's query occurred. A brief example of part of a glossary file is as follows:

```
*
FREQUENCY DISTRIBUTION:  SEE DISTRIBUTION
*
PROBABILITY DISTRIBUTION:  SEE DISTRIBUTION
*
RELATIVE FREQUENCY DISTRIBUTION:  SEE DISTRIBUTION
*
DISTRIBUTION:  THREE KINDS OF DISTRIBUTIONS ARE:  FREQUENCY, PROBABILITY,
AND RELATIVE FREQUENCY DISTRIBUTIONS.  FREQUENCY DISTRIBUTIONS ARE
EMPIRICAL DISTRIBUTIONS FORMED BY SETTING UP A SET OF MUTUALLY EXCLUSIVE
AND EXHAUSTIVE CATEGORIES ON SOME VARIABLE, AND THEN COUNTING THE NUMBER
OF OBSERVATIONS FROM SOME FINITE SAMPLE, FALLING WITHIN EACH OF THE
CATEGORIES.  A RELATIVE FREQUENCY DISTRIBUTION IS DERIVABLE FROM A
FREQUENCY DISTRIBUTION BY DIVIDING EACH CATEGORY FREQUENCY BY THE TOTAL
NUMBER OF OBSERVATIONS.  PROBABILITY DISTRIBUTIONS ARE MUCH LIKE RELATIVE
FREQUENCY DISTRIBUTIONS, BUT WITH EMPIRICAL RELATIVE FREQUENCIES REPLACED
BY PROBABILITIES DERIVED USUALLY FROM THEORETICAL ASSUMPTIONS ABOUT
THE RANDOM PROCESS.  SEE PROBABILITY.
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Here, there are three indirect entries all referring to a single direct entry. Note that "SEE PROBABILITY" at the end of the DISTRIBUTION entry is merely a part of the text to be displayed, and does not function as an indirect reference, since the "SEE" does not immediately follow the first colon on the first line of the entry. It merely suggests to the student that more relevant information might be obtained by a query about probability. Presumably, the glossary file contains such an entry.

Since the glossary search depends on an exact characterwise match of the contents of R: to an entry term, it may be wise to preprocess the contents of R: a little before transferring to the system routine, ASK. For example, it might help to substitute spaces for tabs, to remove extra spaces, and to remove punctuation such as periods and quotation marks. Such operations are easily programmed in a few extra SNOBOL statements. But even with this kind of editing, the format of the query is quite restricted.

It is possible to carry the preprocessing to higher levels, removing insignificant phrases such as "what is," "what are," and "what does _______________ mean." For extensive preprocessing of queries, the lesson may contain a set of special sections for that purpose, which are transferred to only when the student asks a question. However, it is rarely worthwhile to try to carry the preprocessing to very high levels. The linguistic competence of the student to edit and transform his question usually is far greater than that provided by any small set of computer instructions.

CONCLUSION

By now there are quite a few computer programs and systems designed specifically to facilitate the composition of lessons to be administered by a computer. Zinn (1969) and Frye (1969) included about thirty different ones in their comparative reviews. In some cases, they found little basis for comparison, due to the heterogeneity of objectives. The present system, regarded simply as an abstract coursewriter language, probably does not really excel on any of the common criteria of comparison. Its main distinction is that it is designed for and is being used on a computer without a great deal of core memory. With due credit for this handicap it probably would compare favorably with most other systems. The present system trades a little intuitiveness to gain much freedom for the course author to simulate the real-time decision process of a sensitive tutor. The "ugly" aspect is that the course author must think at the level of character strings, but this level of analysis may be natural for some instructional subjects such as computer programming.

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THE ADMINISTRATION OF HIGHER EDUCATION: AN EXPERIMENTAL APPROACH TO FINDING IMPROVED PRODUCTION FUNCTIONS

S. Ray Schultz *

McConnell and Lamphear (1969), in reporting results of an experiment in teaching principles of economics without lectures, conclude that the substitution of capital for labor in such a situation can be done successfully. But they caution that this does not necessarily mean it should be done. Their reason for caution is that the substitution as they view it eliminates student-teacher contact.

There may be a way between the horns of the dilemma. McConnell and Lamphear define pedagogical capital and classroom labor as complete opposites. Pedagogical capital, for them, includes only materials created by someone other than the professor in charge of the course. Classroom labor implies only the labor of the professor in charge, lecturing to the students. Why not re-define pedagogical capital to include materials that utilize the voice and/or picture of the professor in charge of the course, such as cassette recordings and video tapes? Such capital would represent the congealed labor of the professor. When pedagogical capital is viewed in this way, it may be sensible to push very far in substituting capital for labor.

Again, if capital is defined to include the professor's congealed labor, then, in response to the caution raised by McConnell and Lamphear, it should be asked, "Do we have any choice?" This response is suggested in light of the rapidly increasing costs of higher education, the current

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recession, and the public's uneasiness with respect to the college community.

Baumol (1967) has argued that the technological structure of education is such that the quality of teaching, similar to the quality of the live performance of a horn quartet, is judged on the basis of the number of hours used to produce the product (or service). He, thus, argued that education is a technologically nonprogressive industry. He declared that within education, innovations, capital accumulation, and economies of large scale generally do not occur and thus, there are not significant increases in output per hour of work. Persons who have been studying the costs of higher education are agreed that these costs have been increasing very rapidly. This is *prima facie* evidence in support of Baumol's position. More directly yet, some writers (e.g. Ianni, 1964 and Martin, 1968) say that innovation has been occurring very slowly in higher education. Ianni says the average time lag between the development of a new finding in medicine and its application is two years; while the time lag in education is often 30 years. Yet, increasing costs of education, plus an observed slow rate of innovation, do not persuade one to agree with Baumol's view of the technological structure of education.

A major reason why innovations have come slowly in higher education is not the technological structure but rather the incentive system. To innovate in teaching has not seemed worthwhile to faculty. They have been receiving pay increases and promotions largely on the basis of research publications; but experimentation with new ways of teaching is time-consuming and competes directly with opportunities to publish research findings.

However, the tide could be turning now. One reason is that there are now several journals that publish research findings based upon experimentation in teaching. Also, there are now enough new technologists and techniques available that there is much research to be done.

As it now seems reasonable to expect more educational research, suggestions for guidelines seem in order. The remainder of this paper is presented as one example of educational research designed to move in the direction of improved production functions in higher education.

Experiment in Teaching Business Statistics (Fall 1969)

In the Fall of 1969, introductory business statistics was taught as an experiment: (1) No formal lectures were given. (2) The textbook used was programmed. (3) The center of activity was the statistics laboratory room. There, students could participate in any one of several activities. They could solve laboratory problems. They could discuss statistical problems and concepts with one another, the lab assistant, or the professor in charge of the course. The professor and his assistant were present at all lab sessions, and they deliberately tried to encourage discussions. (4) Students could choose to listen to tape recordings on any one of six major topics in introductory business statistics. These recordings were accompanied by parallel written material. The student, to gain from this procedure, had to listen to the tape recorder, while at the same time looking at the parallel written material and occasionally responding in writing on the parallel written material before him. This was similar to a programmed technique, but with the student listening as well as seeing and responding; but also he could be doing all this while in the midst of several other students who might be doing the same, or might be working on lab problems or discussing them with one another, the assistant, or the professor. (5) There was limited self-pacing, until after the first quiz was given. Students were allowed to choose the day for taking that first quiz, provided they took it before a specified deadline date. (6) The total environment was quite free and informal. Students were encouraged to talk freely with one another and/or the lab assistant and/or the professor, as they chose. Students were encouraged to move about the rather spacious room, to sit whenever and wherever they chose, and in fact to leave or enter the room as they chose. This objective seemed to be accomplished. At several times during the quarter, students who were not in the course entered, sat down, and talked together, apparently without realizing that a class was in session.

Theoretical Framework and Model Used in the Analysis

Most of the data used for analysis were obtained by administering a questionnaire to all students in the course, after they completed the final examination. The questionnaire was designed to provide the information needed for estimation of the parameters of a linear multiple regression model. Such a model could be written as follows:

$$X_1 = A + B_2X_3 + . . . + B_pX_p$$

The letters, A, B_2, B_3, . . . B_p designate parameters. The "B" values are regression coefficients. In this particular model, X_{15} refers to number of hours per week the student worked for income while he was in the course. B_{15} should be interpreted as follows: Suppose $B_{15} = -0.27$. This would mean that on the average, for each additional hour of work per week for income while the student was in the course, his grade in the course declined by the amount, 0.27 of a point. The equation actually fitted to the data obtained could be written as follows:

$X_1 = a + b_2X_2 + b_3X_3 + \ldots + b_pX_p$, where $\underline{a}$ is an estimate of $\underline{A}$, $\underline{b_2}$ is an estimate of $\underline{B_2}$, and so on. (The estimators, $\underline{a}$, $\underline{b_1}$, $\underline{b_2}$, . . . $\underline{b_p}$, being based upon sample data are of course subject to sampling error.)

The grade in the course was the dependent variable. The independent variables are broadly described by the following subsets: (1) background of the student, (2) the student's manner of operation while in the course, and (3) the student's attitude toward the way in which the course was conducted.

The subset of background variables is as follows: X_2 is lack of fear of mathematics; X_3 is age of student; X_4 is exposure to mathematics in senior high school; X_5 is exposure to mathematics in college. "Exposure" implies only the number of courses taken, and does not include either the level of sophistication of the courses or the grade earned. X_6 is number of years spent studying foreign languages; X_7 is number of years spent studying music. Both X_6 and X_7 were included, on the assumption that the more a student had worked with symbols, the more successful he would be in learning statistics. X_{14} is marital status (single, zero; married, one); X_{16} is total exposure to mathematics in senior high school and college (merely the sum of X_4 and X_5); X_{17} is number of college credit hours completed before the student entered the course (regarded as a measure of academic maturity); X_{19} is the verbal SAT score, X_{20} is the quantitative SAT score.

The subset of variables designed to describe the student's manner of operation while in the course is as follows: X_8 is amount of discussion of statistics with the professor in charge of the course; X_9 is amount of discussion of statistics with the student assistant; X_{10} is amount of discussion of statistics with other students; X_{13} is a measure of how early the first test was taken. A higher number implies "earlier". The earliest date was represented by 15, and the latest, by one. X_{15} is hours worked per week for income while taking the statistics course. "For income" was specified, because then "hours worked" should represent an inflexible constraint upon the student's time available for studying. Here, the direction of relationship was hypothesized to be inverse. X_{18} is number of other students the respondent usually worked with on statistics while in the course. This variable is similar to X_{10}, but the method of measurement is different.

The subset of variables designed to measure the student's attitude toward the way the course was conducted is as follows: X_{11} is usefulness of the taped presentations; X_{12} is the student's evaluation of self-pacing.

The Findings

There were 118 students in the course, and a completed questionnaire was obtained from each student. However, SAT scores were not available for all these students, so the model was fitted for the 66 students for whom the SAT scores were available, to avoid specification bias. The model was also fitted for all 118 observations for comparison purposes, and no significant differences in mean values were found. In the model fitted to the 66 observations, wherever the standard error of a regression coefficient was larger than the coefficient, that variable was eliminated from the model. The coefficient of determination, then, was found to equal 0.4546, which is significant at the 0.01 level.

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In Table 1, are shown the regression coefficient, standard error, and computed "t" value for each variable retained in the model. In that table, all signs shown are hypothesized, except the sign attached to X_{20}, the quantitative SAT score. From this result, ability in mathematics as measured by the SAT quantitative score is not directly related to success in learning applied statistics. If there is a statistically significant relationship, it is inverse. This result is not entirely unique. Paden and Moyer (1969) found an inverse relation between the amount of mathematics students took in college and how well they performed in economics. Further, a report from both Harvard and the University of Michigan (1970) indicated that those who had studied more mathematics did not perform in statistics as much better as might have been expected than their colleagues. But now, are we to believe that the more ability a student has in mathematics, as measured by the quantitative SAT score, the less success he will have in learning applied statistics when taught in the manner described in this article? Further light on this question may be shed by the simple correlation coefficients for the full model. These are shown in Table 2.

Referring to Table 2, it appears that students who had higher quantitative SAT scores tended to have less fear of mathematics than other students, and had higher verbal SAT scores. Both these variables are significantly and positively related to success in learning applied statistics. It may be that ability in mathematics is important for learning statistics, but that manipulative skill is not the critical component. The quantitative SAT score (X_{20}) is significantly and inversely related to X_8 and X_{10}, the amount of discussion of statistics with the professor and with other students. It may be that the style of learning of students with higher ability in mathematics is that they learn quite independently of the professor, student assistant, and other students, and that they prefer to learn in their own way and without hurrying, when the course is taught as described in this article. It may even be that the way the experimental course was operated, it tended to be biased against such students.

Variable X_{16}, "total" exposure to mathematics, has a significant relation to success in learning applied statistics, but in contrast to X_{20}, this relation is positive. The relationship of X_{16} to other independent variables is similar to that of X_{20}, the quantitative SAT score. For example, students who had more "total" exposure to mathematics did not report more discussion of statistics with the professor, lab assistant, or other students. Yet, X_{16} and X_{20} are not correlated together, and so these two variables might be taken as independent indicators that students who feel they have some ability in mathematics prefer to work rather independently and at their own pace in an applied statistics course. This could be called a private style of learning.

Based on Table 2, the variable X_9, amount of discussion of statistics with the student assistant, has statistically significant positive correlation with each of the following other variables: X_8, amount of discussion of statistics with the professor; X_{13}, how early the first examination was taken; X_{15}, hours worked per week for income; X_{17}, number of college credit hours completed; and X_{18}, number of other students worked with. Regression coefficient b_9 is significant at the 0.01 level. The style of learning described here may be termed "socialized" (as opposed to private).

Variable X_{12}, the student's evaluation of self-pacing has significant positive zero-order correlation with each of the following other variables:

X_8, amount of discussion of statistics with the professor; X_{11}, usefulness of the tape recordings; and X_{13}, how early the first examination was taken. But X_{12} does not have significant correlation with either X_9 or X_{10} (discussion of statistics with the assistant and discussion with other students). Perhaps the style of learning here is "please the professor".

Lack of fear of mathematics (X_2) has a direct relation to success in learning applied statistics. But this also means that the format of the course, stressing informality and openness, did not dissolve this fear and its impact upon success in learning statistics. When this course was taught the next quarter by the same professor and assistant with a conventional format including a conventional textbook, two hours of lectures per week and no self-pacing, the fear of mathematics was still found to have a significant and inverse relation to success in learning statistics.

The variable, hours workedper week for income (X_{15}), was found to be significantly and inversely related to success in learning statistics (as expected). From Table 2, it is clear that there is significant correlation of X_{15} with only one other independent variable, namely X_9, amount of discussion of statistics with the assistant. The suggested style of learning here is "get the answer, don't worry about the process". When the same course was taught the next quarter in a conventional manner, including two hours of lecturing per week, X_{15} (hours worked per week for income) was not significantly related to success in learning statistics. Perhaps in this case, students working for income substituted the lectures for other, more time-consuming activities, such as reading the textbook. These students may also have the style, "get the answer, don't worry about the process".

Policy Implications

On the basis of the experiment and the statistical findings reviewed above, the following characteristics of a course in applied statistics for students such as those found at Cleveland State University seem reasonable: (1) Lectureless. (2) The textbook, if conventional, should be so clear that students can resolve most questions themselves; or it should be programmed. (3) Cassette recordings and/or video tape recordings can be used, with the professor in charge of the course making the presentations. This feature is worth trying again, partly because it helps make self-pacing possible. (4) Laboratory problems would be assigned to students and would be graded by the assistant. (5) Both the assistant and the professor would be available at specified times and places, for students to talk with them. (6) Advisory-group teaching. (7) The advisory groups could be self-pacing, with each advisory group arranging with the professor how often it would meet with him as a group. (8) It might be well to have an oral as well as a written component to the final examination.

A course taught as suggested above would be more efficient in use of space than it would be if taught in the conventional lecture and lab manner. The programmed textbook and cassette or video recordings eliminate the argument for assembling of students in a lecture hall two to four hours per week.

Personal, individualized and group discussions with the professor can be provided for within the laboratory room. The assistant would be in charge of the laboratory and would attend each hour it was open to the students. His availability there would apparently be important especially to the "socialized learning" and the "get the answer, don't worry about the process" groups.

The professor could be in the lab room on a regularly scheduled basis, but perhaps only one hour per week for a class of say, 80 students. Of these 80, those from the "socialized learning" and the "please the professor" groups presumably would be the ones interested in talking with the professor. On this basis, efficiency in utilization of the professor's time may be much improved over the conventional approach. Out of a class of 80 students, from the experiment, not all choose to talk with the professor at all; which means, of course, that 80 students can be served by the professor because they do not all desire his personal attention. But of course, they are still influenced by him, through his organization of the course, choice of textbook, video tapes and/or cassette recordings and choices of laboratory problems for them to solve. If an eight-hour load is taken as the number of contact hours, then at 80 students per "class", an eight-hour load would imply 640 students for one professor in one quarter.

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Table 1

Regression Coefficient, Stand. Error, and Computed "t" Value for Each Independent Variable in Success in Learning Statistics Model

Variable	Regression Coefficient	Standard Error	Computed "t" Value
X_2 = Lack of fear of mathematics	1.02247	0.44489	2.29825^S
X_9 = Amount of discussion of statistics with assistant	1.41875	0.41301	3.43514^{SS}
X_{12} = Student's evaluation of self-pacing	0.50171	0.40366	1.24291
X_{15} = Hours worked per week for income	-0.27347	0.07492	-3.64995^{SS}
X_{16} = "Total" exposure to mathematics	0.34289	0.14286	2.40026^{SS}
X_{19} = SAT score: Verbal	0.02098	0.01254	1.67286^S
X_{20} = SAT score: Quantitative	-0.01986	0.01347	-1.47474

S = Significant at the 0.05 level but not at the 0.01 level when a one-tailed test is applied. Tabular "t" value is about 1.671 for a one-tailed test.

SS= Significant at the 0.01 level when a one-tailed test is applied. Tabular "t" value is about 2.390 for a one-tailed test at the 0.01 level.

Table 2. Simple Correlation Coefficients of "Success in Learning Statistics" Model

	Grade in Course X_1	Lack of Fear of Mathematics X_2	Age of Student X_3	Exposure to Math in High School X_4	Exposure to Math in College X_5	Years of Foreign Language Studied X_6	Years of Music Lessons X_7	Discussion with Professor X_8	Discussion with Assistant X_9	Discussion with Other Students X_{10}
X_1	1.000	.2510^{S}	-.0848	.1545	.1745	-.1533	-.0677	.2962^{S}	.3226^{SS}	.1070
X_2		1.000	-.2112	.1434	-.1525	-.0895	-.0607	-.0398	.1428	-.0763
X_3			1.000	-.2004	.3035^{SS}	-.0194	-.0546	.2434^{S}	.0851	-.0692
X_4				1.000	.1472	-.0698	-.0564	-.1399	-.2199	-.1435
X_5					1.000	-.1095	-.0294	.1100	.0940	.2396
X_6						1.000	.3512^{SS}	.1327	.2228	-.0248
X_7							1.000	.0437	.1608	-.1470
X_8								1.000	.4624^{SS}	.2836^{S}
X_9									1.000	.2378
X_{10}										1.000

Table 2. Simple Correlation Coefficients of "Success in Learning Statistics" Model

	Usefulness of Tapes X_{11}	Evaluation of Self-Pacing X_{12}	How Early First Exam was Taken X_{13}	Marital Status X_{14}	Hours Worked Per Week for Income X_{15}	"Total" Exposure to Math X_{16}	Number of College Credits Completed X_{17}	Number of Other Students Worked With X_{18}	Verbal SAT Score X_{19}	Quantitative SAT Score X_{20}
X_1	.0602	.3268^{SS}	.2251	-.0253	-.3389^{SS}	.2248	.2682^{S}	.1222	.2665^{S}	-.0014
X_2	.0222	.2138	-.0903	-.0830	.0275	-.0151	.1250	-.0564	-.0320	.3680^{SS}
X_3	.1986	-.0816	-.0733	.3311^{SS}	.0729	.0864	XXX	.3852^{SS}	.1025	-.1455
X_4	.0498	.0290	-.0316	.1347	.0064	XXX	-.0513	-.2081	.0419	.1090
X_5	.1371	-.0091	.0321	.3376^{SS}	-.0191	XXX	XXX	.1125	.0612	-.0848
X_6	.1586	.0359	.2070	-.1409	.2253	-.1178	-.0754	.0451	.1437	-.0530
X_7	.1362	.0079	.1228	-.0365	.0224	-.0511	-.0249	-.0107	.0625	-.0070
X_8	.2692^{S}	.3668^{SS}	.5178^{SS}	-.1147	-.0400	-.0113	.3037^{SS}	.2948^{SS}	.0686	-.2865^{SS}
X_9	.0930	.1778	.2461^{S}	-.0056	.2642^{S}	-.0769	.2600^{S}	.3174^{SS}	.0867	-.0272
X_{10}	-.0155	.1806	.1436	-.2882^{S}	.1134	.0705	.4675^{SS}	XXX	-.3020^{SS}	-.2797^{S}
X_{11}	1.000	.3411^{SS}	.1269	.1496	.1488	.1217	.1009	.0744	.0967	-.0012
X_{12}		1.000	.2805^{S}	-.1344	-.1841	.0119	.0790	.0776	.0923	.0695
X_{13}			1.000	-.1383	-.1027	.0040	.1894	.1707	.0680	-.3019^{SS}
X_{14}				1.000	.0074	.3210^{SS}	.0758	-.1960	-.0040	.0570
X_{15}					1.000	-.0174	-.0371	.1521	.2051	-.0649
X_{16}						1.000	XXX	-.0638	.0718	.0075
X_{17}							1.000	.2575^{S}	.0903	-.2960^{SS}
X_{18}								1.000	-.0065	-.1817
X_{19}									1.000	.2600^{S}
X_{20}										1.000

S = Significant at the 0.05 level but not at the 0.01 level (two-tailed test;/7 0.05 ≐ 0.2428).

SS = Significant at the 0.01 level (two-tailed test; /7 0.01 ≐ 0.3156).

REPORT ON AN EXPERIMENT IN PROGRAMMED INSTRUCTION IN BEGINNING GERMAN

Ella R. W. McKee * +

During the academic years 1970-1971 and 1971-1972 several sections of beginning German have used programmed materials. In the first year the material was divided into two quarters; in the second year the textbook was supplemented with additional materials and was used over three quarters. In addition, during the second year another sequence was begun in the Winter quarter with a different instructor. In these three sequences, 158 students were enrolled at the beginning of the first quarter; a total of 270 students registered in the seven courses offered thus far. Presented here are data collected concerning the effectiveness of the program, and some conclusions and recommendations are made.

DESCRIPTION

Common to all three sequences has been the programmed textbook (Ruplin-Russell, Basic German, published by the New Century Division of Appleton-Century-Crofts) and the accompanying tapes. The textbook is printed by a special process so that the answers in the drills appear when an Access Marker is used. Each unit has six frames of drill material; for four frames the correct forms are in the textbook and are given on the tapes. In each of these frames the tapes include one, two or three check items not in the textbook. These help the student to determine the extent of his mastery of the material. Two frames (three and six) are test frames, for which the correct forms are not available. Also common to all

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sequences was the fact that the students in the programmed sections were an average cross-section. In the first two sequences all students registering for Beginning German in block five were automatically in programmed sections; in the third sequence it was block six. In the first year, the students did not know in advance that this would be the format. As a result, some of them dropped out the first day. Since the first year we have used a different numbering system (111, 112, 113 for programmed sections instead of the regular 121, 122, and 123); consequently, the initial drop-out was considerably lower.

Because of the exigencies of space, the external arrangements during the two academic years were different. The only language laboratory facilities available during 1970-1971 were Dial-Access, which did not provide student control of the tape for frequent repetition, necessary for programmed materials. Therefore, a special laboratory was set up in Mather Hall with ten tape recorders. A work-study student was available for record keeping and for providing tapes and test materials. Some of the time this student was a German major who was of real service in answering questions. Since my office was also in Mather Hall, the students found it easy to come for help whenever they had difficulty. All of them availed themselves of this opportunity, so it became an important feature of the program. During 1971-1972, we used the new language laboratory facilities in University Tower which provide individual booths with cassette tape recorders in addition to the Dial-Access equipment. The booths make the vocal repetition of material possible, and the cassettes are easily duplicated so that students can also use them on their own recorders. The present arrangement is much more economical; however, a certain esprit de corps which developed last year in the special laboratory arrangement with ready access to the instructor has been missing this year, and the availability of majors for help in the laboratory has been reduced.

During the first year the only materials used were the textbook and the accompanying tapes. For the second year, a manual was prepared containing additional explanations, a vocabulary list for each unit, more drills, and exercises for oral practice. This was supplemented with tapes. In addition, a test was prepared for each unit and a composite test for every three or four units. Answers for frames three and six in each unit were available in the laboratory so these became study units instead of testing units. These additions and changes were the direct outgrowth of recommendations of students who had completed the two-quarter sequence in the first year. In a survey of this same group during the past Spring quarter, the general reaction was that these changes were helpful. One person, however, objected strenuously to the expansion of the course to three quarters.

During the first year, the class was arbitrarily divided into four sections of equal size (eight to twelve students), each section meeting once a week for conversation, drill, questions and answers. Because of the small numbers, every student had an opportunity to participate in the conversation, and there were opportunities for correction of pronunciation and construction. Students could attend more than one session, if they wished.

During the second year, the class periods were divided into three groups. One of these, with optional attendance, was designated as a drill session and was devoted to explanation of the current grammar, oral and written drill at the board, questions and answers. The other two hours were for oral practice. Students were expected to attend one of the oral practice sessions for each unit, or a total of fourteen hours for each quarter. They could also attend additional sessions, if they wished.

In both years, oral tests were an important part of the course. During the first year these were tests recorded by students on tape. In the second year, the students saw the instructor individually for the oral tests. During each quarter, there were three or four of these tests ranging from eight to fifteen minutes apiece.

The third sequence, begun in the Winter quarter of 1972, was taught by Dr. Charlotte Koerner. She used the same materials: textbook, commercial tapes, supplementary manual and tapes, unit and composite tests. During the first quarter (after two weeks) she divided the class into three groups: Fast, Normal, and Slow, each group meeting once a week. There was also a drill session once a week, which was optional for the fast and normal groups and required for the slow group. Towards the end of the quarter, the normal and slow groups merged so that these students were meeting twice a week. In the second quarter, she used two student assistants to provide extra drill and practice. The entire class met once a week on a voluntary basis, and once a week for dialogs and general work for which attendance was required.

EVALUATION

A. Efficiency

The total number of students taking programmed German in these seven courses was 270; the actual number of individuals involved, without duplication, was 148.

Our original plan was to have about eighty students in the programmed sequence, but that hope did not materialize so we have no real basis for asserting that one instructor could handle a triple student load effectively with programming. However, we did average 38.5 students per section compared to 24.4 students in the equivalent regular sections in those quarters.

Theoretically, I think it is possible to increase the student load per faculty member in the programmed section to eighty students: four hours per week in class with twenty students each time, and about five hours per week for individual oral testing which leaves about three hours a week for grading papers, which would be adequate. Practically, however, I am not convinced; one hour per week with twenty students is not really enough time per student. The arrangement this year with one hour of drill for each unit plus the oral sessions with twelve to fifteen students was a much more satisfactory arrangement - and it still represents a considerably higher student load per faculty member.

B. Student Reaction

The students who have had one, two three quarters of programmed German have been strongly in favor of the method. Students in the first and second sequences, whether they dropped out during a quarter, did not continue in the sequence, or did complete a sequence, were asked to fill out detailed questionnaires anonymously. We have queried 121 students and have had 98 questionnaires returned, or about 81% return.

The question, "If you know someone who was planning to take Beginning German, would you recommend the programmed course?" appeared on 56 questionnaires which were returned; of those 56, 49 checked Yes and only 7 checked No, or a percentage in favor of programming of 87.6. The reasons given for their preference for the programmed course include statements such as these:

> "I am glad I had an opportunity to participate in the programmed course."
> "This course makes it easy to learn German."
> "The students are in a much freer atmosphere ... and this ... will help them learn better."
> "I thought this was a good approach to learning a language. I wish it would continue through fifth quarter German."
> "Since this is the third time I started second quarter German and the first I finished, I obviously like the course, mainly because there is little pressure applied to learn, which is good."
> "I feel the course is very worthwhile. It allows us more independent study."
> "You can work at your own speed."
> "I like the fact that we could take the tests at our own rate."
> "Its informal approach and the responsibility it offered, although I did not live up to it."
> "The smaller classes."
> "The student has more of a say in pressuring himself."
> "You have a good thing going."
> "I think it's great."

It is apparent from this sampling that the greatest advantage which students see in programming is its flexibility and the freedom to structure their work individually. That characteristic was also listed as its chief disadvantage, with students generally saying that it was too easy to procrastinate, that they have to set their own standards for achievement and that they may set these standards too low.

In spite of the fact that students generally complain about compulsory class attendance, about one-third of the respondents indicated that they would prefer more class sessions. One student said that he had paid for four hours of a teacher's time and he resented having been "gypped." On the other hand, another student felt that the necessity for working in the laboratory meant that he was expected to be in class twelve hours a week instead of four!

Among the questionnaires returned are those from fifteen people who were in the 121 programmed course in the Fall of 1970, and who have now completed all their work in German. The first question asked for a listing of grades in the five quarters. The seocnd question (responses in parentheses) was "What was your feeling about your background in 121 and 122 as you went to successive courses?" "I felt that my background in 121 and 122 was

1. superior to other people in my class."
2. on a par with other people in my class" (four students).
3. somewhat poorer than that of other people in my class" (six students).
4. seriously poorer than that of other people in my class" (four students).

Of the four students who checked the fourth answer, two had been very weak students in the first two quarters, as shown by the grades listed in the first question on the questionnaire, but they had survived because of the slower pace which they could follow. The other two had done B work in the programmed course and continued ath the B level in the later courses, but they felt that they had difficulty because they were too accustomed to listening to taped voices and, therefore, found it hard to adjust to free conversation in a class situation.

Of the six who felt that they were somewhat poorer than other students, four had received a D in both 121 and 122, which would indicate that they were almost sure to have problems. Two had received C in 121 and 122, but they were both very much on the borderline.

All of the fifteen students in these groups felt that completing the course in two quarters had resulted in considerable superficial learning. It will be interesting to see how this year's students, who have had three quarters in which to cover the same essential material, will fare in 124 and 125.

It is apparent that the subjective data indicated by the questionnaires are not conclusive, although the trend seems to favor programming.

C. Student Performance

1. Grades

The statistical data which I have collected are equally open to several interpretations and can hardly be called conclusive.

Table I shows a comparison of percentages of grades achieved by three groups of students: 1 - students who began Beginning German in the programmed section in the Fall of 1970; grades were tabulated for those who continued in subsequent courses; 2 - students who began Beginning German in the regular sections in the Fall of 1970; grades were tabulated for these students who continued in subsequent courses; 3 - all students registered in 122, 123, 124, or 125 in equivalent quarters.

On the basis of the percentages in Table I it is apparent that the pattern of grades established in the first two quarters of the programmed course remained relatively consistent throughout the other quarters in regular sections.

In the programmed section we were dealing with an initial group of sixty-four students taught by one instructor; in the regular sections we had initially seventy-eight students taught by four instructors. In the second quarter we had a continuing group of fifty-two students in the programmed section, taught by one instructor, and thirty-five continuing in regular sections with twenty additional students (or a total of fifty-five students) taught by three instructors. Keeping that faculty-student ratio in mind, one sees that variations in percentages of grades earned by students in programmed and in regular sections are of minimal significance.

Table I - Comparison of Grades Achieved by Students Enrolled in Beginning German in Fall 1970

	121	122	123	124	125
A - 1	6.2 %	5.7 %	7.4 %	12.5 %	16.6 %
2	10.2 %	14.2 %	14.3 %	20.0 %	14.2 %
3		12.7 %	11.4 %	*	*
B - 1	25.0 %	23.0 %	25.9 %	25.0 %	41.6 %
2	18.0 %	37.1 %	28.5 %	25.0 %	35.7 %
3		27.2 %	29.5 %		*
C - 1	28.1 %	32.6 %	40.0 %	25.0 %	16.6 %
2	21.8 %	25.7 %	50.0 %	40.0 %	50.0 %
3		21.8 %	39.3 %	*	*
D - 1	15.6 %	13.4 %	18.5 %	18.7 %	16.6 %
2	10.2 %	11.3 %		5.0 %	
3		10.9 %	8.1 %	*	*
F - 1	6.2 %	5.7 %	3.5 %	6.2 %	
2	14.1 %	2.8 %		5.0 %	
3		3.6 %		*	*
W - 1	18.7 %	19.2 %	7.4 %	12.5 %	8.3 %
2	24.3 %	8.5 %	3.5 %	5.0 %	
3		23.6 %	9.8 %	*	*
P - 1					8.3 %
** PHR 1	2.24	2.11	2.24	2.21	2.63
2	1.96	2.56	2.55	2.52	2.64
3		2.45	2.42	*	*

(* - Because students who had completed 123 took their 124 and 125 courses at such diverse rates, it was impossible to find equivalent courses for comparison purposes.)

(** - The point hour ratio is a composite figure for the entire class.)

One possible explanation for the higher point hour ratio for 122, 123, and 124 in the regular sections may be the higher rate of F's in 121: 6.1% for programmed and 15.4% for regular sections. It would seem that weaker students made it through the five quarters of German with a programmed background, which allows for self-pacing, although their grades continued to be low in the regular sections. In the regular sections of 121 such weaker students were eliminated with F's.

The pattern of grade percentages for the other two sequences of programmed German in comparison to regular sections in the same quarters is sufficiently similar to that of the first year that it seems unnecessary to include the detailed figures here. The point hour ratio for each of the classes involved shows quite clearly the similarity in grade percentages.

It is apparent that there have sometimes been wide differences between grades achieved in programming and in the regular sections, but, considering the whole pattern, there has been essential similarity, in spite of the fact that the faculty-student ratio has been much higher for program and that on the surface it appears that there was less contact in class under programming.

2. Proficiency

Another measure for the effectiveness of the programmed approach is the scores on the Modern Language Association test which is used as a placement test for students entering college with high school German. This test has been given our own students on several occasions in order to establish and validate norms. Mr. Carl Finkbeiner in the Testing and Counseling Office did a comparative study using the scores made by students last year after two quarters of programmed work and this year after three quarters of programmed work. I quote his report in its entirety:

> "A case may be strongly made that a distribution of scores may be adequately described by its mean and standard of deviation (an index of variability) without losing much essential information. The t-test, which was used here, tests the hypothesis that the various distributions, as described by the means and standard deviations, overlap so much as to be indistinguishable.

Table I

	Listening		Reading		Total	
	Mean	S. D.	Mean	S. D.	Mean	S. D.
122 reg.	22.63	7.98	21.17	6.88	43.79	14.13
122 exp.	18.13	8.08	16.43	8.47	34.55	15.67
123 reg.	22.81	8.29	25.96	8.77	48.77	15.91
123 exp.	26.61	8.13	24.94	10.76	51.56	18.14

Table II

Grp. 1 vs.	Grp. 2	Total Difference Grp. 1 - Grp. 2	t	Probability	Significant Difference
122 reg.	122 exp.	9.24	2.3705	.05	Yes
122 reg.	122 reg.	-4.98	1.4178	.05	No
122 reg.	123 exp.	-7.77	1.5603	.05	No
122 exp.	123 reg.	-14.22	4.8701	.01	Yes
122 exp.	123 exp.	-17.01	3.6437	.01	Yes
123 reg.	123 exp.	-2.79	0.6746	.05	No

"The first table reports the means and standard deviations for each of the three M.L.A. scores that were obtained from the four groups: 122 and 123 regular class (122 reg. and 123 reg.) and 122 and 123 experimental class (122 exp. and 123 exp.). The total scores for the four groups were then t-tested one against another with the results reported in the second table. The two groups being compared are reported in the first two columns. The mean Total Score for Group 2 was subtracted from the mean Total Score for Group 1 and this difference is reported in the third column. The t-statistic is reported in the fourth column and in the fifth column is the level of significance of that statistic. The sixth column indicates whether the between group differences reported in column 3 are significant at a traditionally accepted level. Thus, for example, 122 reg. is 9.24 points higher than 122 exp. on the average and this is a significant difference.

"I would like to point out a few things. First, no distinction may be made between 122 reg. and 123 reg. There was, however, a significant difference between 122 exp. and 123 exp., indicating hopefully that there was an experiential difference between experimental and regular German classes. Furthermore, there is no distinguishable difference between 123 reg. and 123 experimental which would indicate that with regard to those things about German measured by the M.L.A. test, the experimental course seems finally to have taught as much as the regular course does."

3. Withdrawals

In order to determine whether or not the programmed approach was a significant factor for students who withdrew from the course, a questionnaire was sent to every student who withdrew from the course officially or who simply dropped out. I included those students, too, who received an NR at the end of a quarter and never removed the grade. The percentages of these drop-outs for each quarter, together with those in regular sections are as follows:

Table II - Withdrawals

		Programmed	Regular
121	Fall 1970	16.2 %	24.3 %
122	Winter 1971	19.2 %	23.6 %
111	Fall 1971	15.7 %	20.0 %
112	Winter 1972	20.7 %	7.1 %
111	Winter 1972	3.7 %	
113	Spring 1972	4.1 %	20.8 %
112	Spring 1972	41.1 %	14.7 %

Of the sixty-two students who withdrew or dropped out of the first and second sequence, thirty-five answered the questionnaire, or 56.4 %. Eleven indicated that they withdrew because they did not like programmed study, or 31.0 %. Specific aspects which they disliked were:

> "Wanted or needed more time in class."
> "Did not have time or did not want to use lab."
> "Too prone to procrastinate and, therefore, fell far behind."
> "The pace was too fast."

The other sixty-nine percent dropped the course because they dropped out of school, because they were transferring to another college, because they were changing majors and/or colleges, or because they were carrying too heavy a load.

It seems apparent, therefore, that withdrawal from language classes is not significantly related to the methodology in the class; in almost all cases the percentage is similar in programmed classes and regular classes.

CONCLUSIONS

I asked Dr. Charlotte Koerner, who taught the third sequence in programmed German this year, to comment about her reactions. She writes the following:

> "From my experience of teaching the first two quarters (Ger 111 and 112) of Programmed German during Winter and Spring 1972, the following observations seem most noteworthy:

"1. The approach as practiced in my classes works very well, if it works at all. Students who take the programmed course because they enjoy working by themselves and self-pacing are unanimous in their preference of this method over other methods. However, students who don't have this initial motivation tend to get further and further behind. Therefore: it is absolutely essential to develop the best direct reward situation possible in order to make the course profitable for this latter group also.

"2. Because of the limited class contact time, oral performance lags significantly behind that of students on the same level in regular courses. Reading and writing, on the other hand, are surprisingly successful. Considering the low oral skills, I was also astonished at times how good the students' comprehension was.

"3. Small class size did not compensate for the limited class contact time. At present, the greatest problem to me is the feedback to keep the average student going.

"I had two assistants (German majors), one a native, the other an American student whose own proficiency was on the level of 400-courses in general but who is still making the common grammatical mistakes. Here in summary are their comments on the experience, freely translated from German:

> "Native - In theory, the structure of the course should be effective and it basically is so in practice. There was no lack of attempts to motivate the students. Both the teacher and the assistants took great pains to provide opportunities for learning, improvement, and rewards. However, many students lacked self-discipline, talent, and, especially, true motivation to learn languages. Perhaps more supervision and help in the lab and more contact hours would bring better results.
>
> "American - I considered the small size of each group a great advantage for the students. It gave them much more drill time per class hour. It also made a more relaxed atmosphere possible. On the negative side, there was lack of adequate preparation on the part of the students resulting in wasted time when we drilled. There was a certain amount of confusion when the procedure varied somewhat from lesson to lesson. For a beginning language course, there was not enough teacher-student contact. There was not enough pressure on the students to keep up their performance between class meetings. Because of the limited contact time, instructors don't get to know their students as well as in other courses."

After five quarters of experimenting with this approach, on the basis of the statistical material presented here and my own subjective reactions, I would draw these conclusions, some of which differ from those of Dr. Koerner and her assistants:

1. Programming is an option which should be available in German. It offers one way to offset to a degree the expensive beginning courses required by more conventional procedures.

2. Some students can do the work successfully without benefit of an instructor, but most students profit from some contact with an instructor and with other students.

3. Oral tests are effective. If they are conducted for testing purposes only, a tape recording is valuable. If they are to be used for both teaching and testing and for contact between instructor and student, the face-to-face test is more meaningful. The difference in time expenditure for the instructor is negligible. The tape recordings have the advantage of being available for later comparison and can be listened to at one's convenience instead of having to schedule individual testing times with students. A combination of face-to-face testing with tape recording has distinct advantages.

4. The self-pacing feature is significant. It is safe to say that every student in the five quarters which I taught followed his own pace, sometimes moving faster sometimes slower. Its chief advantage is that it enables the slower student to move more slowly, hopefully absorbing material more thoroughly. However, it appears from the scanty evidence of students who have completed five quarters, that these students who paced themselves slowly in the programmed courses encountered problems in later quarters because they had to adapt to the pace of the class. Unfortunately, during these quarters only two students availed themselves of the opportunity of completing three quarters of German in two quarters. This is a feature that needs development.

5. Some proponents of programming maintain that students necessarily learn the material more thoroughly. I have not found this to be the case on the whole. It is true that a student can do more thorough work, but it is my impression that most of the students who have taken the programmed

courses here have been so conditioned by previous experience to partial learning that they have not been motivated to learn more thoroughly when the opportunity presented itself. Techniques do not change attitudes of students. Those who wish to avoid the pain of learning can do quite effectively with programming; the attrition rate may indicate that it becomes clear to them earlier that they are doing just that.

6. Greater individualization is possible under the programmed approach than in regular classes; therefore, programmed courses lend themselves to the solution of the ever-present problem of the articulation between high school and college courses and courses in different colleges.

7. Because of the small size of the conversation classes and the personal contact of the oral tests, I found that I knew these students much better than those in regular classes. The students also commented favorably that they knew each other very well. The strength of both the student-student and the student-teacher interaction may have been the result of the same group of students and the same instructor working together for three quarters.

4. Recommendations

In considering the continued use and further development of programmed instruction in German, I see these areas of concern and of possible expansion.

1. Programmed materials should be developed for 124 and 125 so that the students may be able to complete the entire language sequence with programming.

2. Closer structuring should be developed within the framework of self-pacing. Particularly, in the Spring of 1972, students tended to complete unit tests but to wait with oral tests and composite tests until almost the end of the quarter. This delay undermined the effectiveness of both the oral and the composite tests.

3. Materials should be developed so that, within the framework of programming, a student could choose to emphasize one of the skills: e.g. reading

more than speaking, or vice versa.

4. The College of Arts and Sciences might consider a study to determine why so many students drop out of school after one or two quarters. This was certainly the largest single factor in the attrition rate during the five quarters of the language sequence for those who began with programming. Comments such as these came from drop-outs:

> "Thank you for sending this to me. It shows that some people at C.S.U. still care about the student."
> "It is not often that a teacher ... is concerned about his students."
> "I thank you for your efforts ... to listen to the viewpoints of people who are often forgotten, once the IBM card marked _drop_ is punched."

5. Students entering with high school German who do not wish to continue at the level indicated by their placement scores should be assigned to programmed sections for rapid review of the skills in which they fall short.

6. All three quarters could be made available in one block so that small groups of students in any one quarter at a particular level could be accommodated economically. It would be possible also to develop a program of interaction between these students at different levels.

7. Further studies might be done to determine how much the students in the programmed sections were experimental, as well as by the fact that they had the same instructor for several quarters.

PART THREE

EVALUATING INSTRUCTIONAL EFFECTIVENESS

PART THREE

EVALUATING INSTRUCTIONAL EFFECTIVENESS

The papers in this section of the monograph were presented at a conference on May 8, 1972 titled "Faculty Development: Evaluating Teaching" which was sponsored by the Innovative Teaching Group. The major goal of the conference was to consider and define the parameters of evaluating classroom instruction for the improvement of learning and for the professional advancement of faculty. Perhaps the outstanding lesson of the day, to those who planned the conference at any rate, was that the issue of evaluation was even more sensitive a topic than they anticipated. And, it is not entirely clear (even yet) that evaluation for improvement and evaluation for advancement can felicitously be harnessed together. Each of the papers, to one degree or another, acknowledged the profundity of this and related problems.

The first paper by Richard I. Miller, Vice-President for Academic Affairs, Baldwin-Wallace College, establishes and identifies the major issues. He makes very clear that faculty evaluation must be considered within a broad developmental framework which includes sabbatical and research leaves, summer grants, workshops, post-doctoral scholarships and on-campus programs as well as evaluation. Each should contribute to a systematic program of faculty development. Faculty development, he stressed, should proceed in a manner consistent with the overall purposes of higher education. He defined those purposes as: (1) to think effectively, (2) to communicate thought, (3) to make relevant judgments, and (4) to discriminate among values. Having established this general perspective, Dr. Miller then discusses a series of generalizations about faculty evaluation which are predicated upon the view that any system of evaluation should take into account the existing relationship between society and higher education today, as well as some "givens" regarding faculty evaluation procedures.

Professors Richard Fenker and Leigh Secrest describe efforts at Texas Christian University to implement a faculty evaluation procedure after a charge to do so was given by the Chancellor of the University. The goals of the project were to improve the university by recognizing and rewarding "excellence" in all aspects of administrator and faculty behavior and to reduce the arbitrariness of the decision-making processes associated with promotions, tenure and raises. Both objectives were to be accomplished by making the goals and reward structure more explicit. The paper provides a valuable look at the "micro-processes" of evaluation which developed at TCU and are likely to be involved in the first steps anywhere. It is important to note that those involved in the TCU project realized and struggled with the question of whether the need for evaluation really outweighed implementation problems. They confronted this problem first. Implementation itself sparked faculty attitudes which, together, amounted to resistance. Some of the problems -- political and altogether human -- encountered by Fenker and Secrest illustrate Miller's point that even the most rational and perfect of evaluation procedures must be carried out by people, who are not always rational.

The last paper by Professor Robert Blackburn and Mary Jo Clark specifically addresses faculty performance as it is perceived by various members of the university community, particularly the individual faculty member himself. These authors characterize the "academic man" as a rather special kind of individual. Of lofty intellectual pursuits, he or she finds the world beset with problems which can only be avoided by choosing academia as opposed to some other career. The authors disagree with Miller as to whether enough is known about the evaluation of teaching to start procedures. They cite the lack of valid data and, to that extent, seem to support the objections faculty members typically raise to evaluation. More important, they imply that, even if valid programs were ready, the human factor ought still be accorded high respect. Their data indicate the extreme discrepancies between perception of good teaching by the faculty member being evaluated on the one side, and his colleagues, administrators and students on the other. The finding that warrants the most attention relates to the differences in perception held by the administrator and the faculty member under review. In other words, if an administrator fails to understand that ego is attached to, and protected by, high self-esteem, he is bound to sew seeds of confusion, misunderstanding and mistrust.

It will not do to dismiss any of the warnings that this study has raised. No one ought to doubt that faculty attitudes toward evaluation of their teaching are negative. There are several contributing factors in explanation. Primarily, instructors are inclined to see little that is wrong or lacking with the quality of university instruction (i.e., their own). As well, they are generally distrustful of the techniques and procedures of evaluation, if for no other reason than the vagueness with which many evaluation schemes are presented. Faculty, moreover, have understandable difficulty in seeing how evaluation is going to improve their lot in these days of tight budgets. And it is difficult for university administrators to argue that faculty evaluation is really a vehicle to greater rewards rather than being merely an elaborate and sophisticated clocking and monitoring tool. It must be said, in all candor, that few universities dignify this evaluation of teaching by providing sure rewards in salary increases, tenure and promotion for those whose teaching is certifiably excellent. Where these warnings are not heeded, it may well be the administrators' need to be forward looking which is being fulfilled by evaluation rather than legitimate concern for improved learning. It is fairly easy to predict that faculty will resist evaluative efforts if the most obvious outcome will harm them personally.

Despite the difficulties and legitimate sensibilities, it is probably in our age of "accountability" that the pressures for evaluation will become insufferable. The creative and caring administrator will seek to involve the individual in the establishment and implementation of workable, equitable and understandable evaluative procedures and standards. The administrator will strive to ensure that the faculty member's rights to fair review on issues of merit, to honest feedback to developmental assistance, and to unprejudiced appeal are guaranteed. For his part, the faculty member ought to take the lead in subjecting his teaching to evaluation and using the feedback for improvement. Evaluation of teaching, in the service of stimulating student learning, can be a legitimate procedure, so long as it also serves the faculty's need for esteem and recognition.

THE FEASIBILITY OF FACULTY EVALUATION

Richard I. Miller*

This conference is scheduled to focus upon improving academic performance through evaluation of teaching, or viewing faculty evaluation as an aspect of faculty development. Those who initiated today's workshop are to be commended for coming to grips with one of the most sensitive aspects of academic life. The problem is not new, as Dr. Logan Wilson, former president of the University of Texas, pointed out over 25 years ago in The Academic Man: "Indeed, it is no exaggeration to say that the most critical problem confronted in the social organization of any university is the proper evaluation of faculty services, and giving due recognition through the impartial assignment of status." (Wilson, 1942).

I would like to return to a phrase used in the opening sentence: "improving academic performance through evaluation of teaching." The use of this phraseology represents my commitment to viewing faculty evaluation as a "means" rather than an "end" -- a "means" toward accomplishing the broader purposes of higher education. A Harvard Committee developed in 1945 what has become a classical statement of general purposes of higher education. The intervening years have sharpened the need for higher education to define its mission and seriously to consider the four traits mentioned in the Harvard Report: The ability -- to think effectively, to communicate thought, to make relevant judgements, to discriminate among values (Harvard, 1962).

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In view of my assignment, I will refrain from discussing faculty evaluation in relation to institutional goals and directions, which is a subject worthy of a paper in itself. It is difficult to judge progress in faculty development without some knowledge of desired directions.

A second dimension of the means-to-end or part-to-whole relationship is the one between faculty evaluation and faculty development. One should not confuse the part with the whole. Faculty development is the overall consideration that includes teaching evaluation, and more. Improving academic performance, not only of faculty but of administrators and staff, should be very high on the list of institutional priorities. Budgetary allocations of significance are necessary for extensive and meaningful faculty programs, which include sabbatical and research leaves, summer grants, workshops, postdoctoral scholarships, and on-campus programs.

I would like to move directly into the rationale of this paper through a series of generalizations about faculty evaluation. This approach is predicated upon the view that a system of evaluation should develop from certain basic assumptions about society, the particular institution, and the process and procedure of evaluation.

1. A national trend toward greater accountability will become increasingly evident in the seventies. Colleges and universities can be expected to become increasingly conscious of cost-effectiveness and

cost-benefit procedures in the seventies. Taxpayers, trustees, and donors have a right to expect more efficient management of institutions of higher education that is now present in some instances, and the severe economic conditions demand it. Speaking at the annual conference of the American Association for Higher Education, Dr. Clark Kerr stated: "Cost-effectiveness of operations will be more carefully examined. If this is not done internally, it will be done externally by the new experts working for legislatures and governors." (Kerr, 1971).

A note of caution might be sounded at this point with respect to possible implications for academic freedom. Some actions by state legislatures in the area of accountability have been thinly veiled efforts to move in a punitive rather than a positive manner, and in ways that may threaten academic freedom. We need to be sensitive to these tendencies and to oppose them.

2. Faculty evaluation does take place, by someone or by something. The question is whether the procedures used and the individuals using them constitute an optimal process. As B. J. Priest points out, "Evaluation is an inherent element of any organized effort to achieve a goal." (Priest, 1967).

No one likes to be evaluated, and it is a threatening procedure regardless of how it is approached. Most of us would prefer to rely upon our own instincts and experiences for an ongoing self-evaluation. But such evaluation is limited by its nature, as Cassius pointed out to Brutus.

> Tell me, good Brutus, can you see your face?
>
> No, Cassius, for the eye sees not itself
> But by reflection, by some other things.....

Whether the individual wishes it, evaluation does take place. This point is obvious to the young, nontenured college teachers, but how about the older professors who have tenure and detailed knowledge of the institution? How are they evaluated? The present situation in most colleges and universities has self-evaluation as the prime procedure, but is this adequate? If a senior professor never is evaluated or never visits classes of colleagues, can we expect him to maintain and improve his pedagogical skills? Almost everyone wants to perform better because he gains greater satisfaction when things are moving along and when improvement is taking place. But is self-evaluation, in itself, acequate for providing pedagogical assistance?

Every college teacher is discussed and analyzed often from midnight to 2:00 a.m. And every college teacher is scrutinized by colleagues, even if from afar and if upon nonclassroom data. Yet how many professors ask colleagues for an evaluation of their teaching performance?

How do professors view teaching evaluation? Gaff, Wilson, and others reached this conclusion from their survey:

> "Seventy-two per cent of the faculty said they favored a formal procedure to evaluate teaching. Eighty-two per cent of those in favor felt that students should be involved in the evaluation, 76 per cent felt that colleagues and 73 felt that departmental chairmen should also be involved ... In a 1970 survey, 85 per cent of the respondents endorsed the idea that a formal program of teacher evaluations of faculty should be "used by the college in making decisions about such matters as salary, promotion, and tenure." (Gaff et al, 1970).

3. Carefully developed faculty evaluative procedures do have validity. Some individuals would challenge the validity of evaluative procedures in general and student appraisal procedures in particular, asking: "How do we know that appraisal procedures are able to identify outstanding or poor teaching?" In other words, how do we know that professors who are highly rated by students are, in fact, outstanding teachers? The question is a fair one in view of the inadequate research basis that has been built in this particular area, but we do have some research evidence. The Center for Research and Development in Higher Education conducted a study of university teaching for the Davis campus of the University of California, with these three principal findings: (1) There is excellent agreement among students, and between faculty and students, about the effectiveness of given teachers. (2) Best and worst teachers engage in the same professional activities and allocate their time among academic pursuits in about the same ways. The mere performance of activities associated with teaching does not assure that the instruction is effective. (3) Eighty-five items are listed that characterize best teachers as perceived by students, and fifty-four items are listed that characterize best teachers as perceived by colleagues. All items statistically discriminate best from worst teachers with a high level of confidence. (Hildebrand and Wilson, 1970).

The Purdue Rating Scale for Instruction was initially developed in 1926, and extensive and intensive research has accompanied its various refinements. This research, in essence, concludes: "A third of a century of use ... by many teachers and a very considerable amount of experimental research . . . have demonstrated that student evaluation is a useful, convenient, reliable, and valid means of self-supervision and self-improvement for the teacher. (Remmers and Weisbrodt, 1965). And from his study of the literature on the question of validity, McKeachie writes that, "in summary, student ratings do have some validity. Teachers rated as effective by students tend to be those teachers whose students learn most." (McKeachie, 1969).

4. Every system of evaluation can be improved. An institution should not seek the perfect system, which will never exist, but neither should a system be selected without careful study. In the area of instruments for student appraisal of teaching, to take one example, several excellent instruments with impressive research bases can be found. Too many universities spend time on developing their own instrument when this time could be better spent on other phases of the overall procedures. An institution could select an instrument already developed, make appropriate modifications according to its particular nature and interests, and then have more time available for the complexities related to developing, implementing, and using a system of evaluation.

Some universities have attempted to spell out all details and answer all questions before the system was introduced. This approach suffers on at least two counts. It is more vulnerable to criticism because some details will always be left unanswered or left at a controversial point, and it may be afflicted with hardening of the categories so the modifications that emerge from experience will be difficult to accomplish.

Some academicians will judge faculty evaluation in terms of absolutes. Since techniques and procedures for faculty evaluation are less than perfect and since not all dimensions of the matter are covered by solid research, some critics would continue to rely upon completely subjective procedures rather than recognize the advances that have been made in systems of evaluation and try to make improvements. The "all-or-none" law applies in physiology but not in human relations.

5. Reliance upon any single input is not desirable. The total array of professional activities, with teaching foremost, is too diverse and complex to be fairly evaluated by one input. However, one systematic and reliable procedure is better than any number of casual and highly subjective ones. In their extensive and current survey of the educational literature on student ratings of college teaching, Costin and colleagues (1971) reached this conclusion:

> ". . . We wish to emphasize that student ratings of undergraduate teaching fall far short of a complete assessment of an instructor's teaching contribution. . . . Nevertheless, if teaching performance is to be evaluated . . . a systematic measure of student attitudes, opinions, and observations can hardly be ignored. The data which have been reviewed strongly suggest that the use of formal student ratings provides a reasonable way of measuring student reaction."

My own work on evaluation of teaching calls for a choice among five procedures for evaluating classroom teaching: student evaluation, classroom visitation, teaching materials and procedures, special incident, and self-evaluation. The specific weighing of all or some of these components are determined by consideration of institutional, departmental, and individual needs and interests.

6. Effective procedures for gathering, processing, and utilizing data are needed. The finest instruments can be for naught if consideration is given only to the first step -- the development of evaluative criteria. This initial step is important -- and so are three other aspects: gathering, processing, and utilizing data. I will not go into detail on these dimensions but only point out something of their contributions to the overall success of an evaluative system. Gathering evaluative data is complex, and careful thought needs to be given to it. One research study compared student ratings of classroom teaching when the instructor handed out the rating sheets and remained in the room during the ratings, as compared to when the instructor was out of the room when the ratings were made. Student ratings were significantly higher when the instructor stayed in the room. (Kirchner, 1969).

Efficient and economical processing is necessary. The use of the computer is almost essential for an institution of any size, and such a commitment requires time, experience and money. Swift processing of the data allows optimum opportunity for study and use of the results.

And data need to be presented in a non-technical and simplified form. Computer printouts and masses of undigested data can be confusing and misleading, and accurate data are of little value unless they are understood and used.

7. Strategy for developing the system of evaluation needs careful consideration. (Miller, 1972). A summary of some component parts of such a strategy might include: administrative support, careful study,

trial runs, faculty resistance points, open forums, ample time, systematic appraisal. The strategy suggested by Eble (1970) follows this pattern:

1. Gaining the cooperation of the faculty
2. Defining purposes, objectives, and uses
3. Arriving at means and procedures
4. Making crucial policy decisions
5. Establishing an office for administering the program
6. Keeping the campus community informed
7. Financing a continuing program
8. Maintaining a student and faculty interest and involvement
9. Conducting follow-up activities and studies
10. Relating evaluation to other efforts to recognize, reward, and improve teaching.

In conclusion, I would like to return to the title of this paper: the feasibility of faculty evaluations. Is a systematic procedure for faculty evaluation feasible? My view relates both to research and to experience with institutions that have developed or are developing such systems. I believe they represent what would be considered dynamic and solid academic institutions, perhaps somewhat akin to the aphorism, "the rich get richer!" Those institutions in most need of improvement often are those that least want it.

Heisenberg, one of the early leaders in theoretical atomic physics, developed the principle of indeterminancy, or the "uncertainty principle," which states that the position and velocity of an electron in motion cannot be measured simultaneously with high precision. This principle is accepted by scientists as honest recognition of imprecision yet it has in no way deterred the relentless pursuit of precision. Something of this spirit is needed when one undertakes faculty evaluation.

In the final analysis, only people can make systems, programs, or organizations work. The process of developing, introducing, and managing a system of evaluation is a human problem. The sensitivities and fears of individuals are real and need always to be considered in the implementation of any system, but a progressive and dynamic university is built by accentuating the positive and by moving ahead. (Eble, 1970).

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TEACHER EVALUATION AT TEXAS CHRISTIAN UNIVERSITY: AN ANALYSIS OF THE PERCEIVED ROLES OF FACULTY BY STUDENTS, ADMINISTRATORS, AND FACULTY

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INTRODUCTION

The dilemma of faculty evaluation is succinctly characterized by the following statement of assumed adequacy: administrators "ask for evidence of scholarly competence but assume teaching competence." And students ask for evidence of teaching competence but assume scholarly competence (Hammond, Meyer and Miller, 1971). When the ambivalence suggested by this statement is coupled with an uncertain and frequently nondiscriminating reward structure, frustrations associated with tight academic budgets, and the absence of definitive measures for evaluating the many complex aspects of faculty behavior, then the cautious outlook many faculty and administrators have toward evaluation programs can be understood. An awareness of these difficulties nevertheless does not greatly mollify the administrator faced with the practical problem of disbursing rewards or the faculty member who demands that his achievements be recognized and rewarded. Cognizant of many of the pitfalls associated with evaluation procedure, yet pressed by practical needs, TCU decided to implement an experimental evaluation program. This paper discusses the issues that

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*Texas Christian University

were considered in designing the program at TCU and presents data on the roles of faculty as perceived by various groups within the University.

As a result of a self-study program, suggestions from University advisory groups, and impetus provided by the Chancellor, Texas Christian University embarked on a full-scale evaluation program during the Spring of 1971. The program was intended to meet the following needs or goals:

1. To improve the overall quality of the University by providing an objective means for evaluating its personnel, suggesting improvements or changes, and distributing rewards on the basis of a sufficiently complex definition of excellence.
2. To acknowledge the importance of excellent teaching and to implement this conviction in the University's reward structure.
3. To reduce the arbitrariness of the decision-making processes associated with tenure, promotions, and raises by making the reward structure more explicit.
4. To recognize the diversification of behaviors that constitute "excellence" for a faculty member or administrator and to establish criteria for evaluating these behaviors.

A university committee was appointed to develop evaluation instruments and if possible conduct a trial run of the evaluation procedures during the 1971-72 academic year.

Much of the material in the present paper is based on the work of this university committee. The paper is divided into two major sections. The first contains a description of the activities of the committee in planning, developing and implementing the evaluation program. The second section presents the results of a "validation" study intended to provide feedback from faculty, students, and administrators on the suitability of the evaluation instruments. The validation data were used to investigate differences in the perceptions of the various subgroups within the university community.

THE EVALUATION PROGRAM

Questionnaire Development

It was the committee's original intention to develop instruments for upward, downward and parallel evaluation of faculty and administrators. Although at the time these instruments were designed, it was anticipated the upward evaluation of faculty, the teacher evaluation, would meet the most resistance, this hunch could not have been more wrong. The committee constructed instruments[1] for teacher evaluation (faculty by students), colleague evaluation (faculty by faculty), self-evaluation, evaluation of professional staff, and evaluation of the state of the university. Each questionnaire had a different set of guidelines, however, the current paper will be concerned only with the teacher evaluation.

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[1] Three of these instruments, the teacher evaluation questionnaire, the colleague questionnaire, and the administrator questionnaire are given in Appendix A.

The teacher evaluation questionnaire was developed primarily on the basis of other successful questionnaires, particularly the one constructed at the Davis campus of the University of California (Hildebrand and Wilson, 1971). The individual items on the questionnaire were divided into six categories, five of which represented the following scales: analytic/synthetic approach; organization/clarity; instructor-group interaction; instructor-individual student interaction; dynamism/enthusiasm. The sixth category contained questions related to specific mechanical details of the course. Most of the questions selected for inclusion on the questionnaire had been shown in previous research to discriminate significantly between good and poor teachers.

The colleague evaluation instrument was designed to measure the variety of activities that characterize faculty behavior at an institution such as TCU. The major categories of faculty behavior were:

(a) Teaching: classroom and interactions with individual students;

(b) Research: current activity, creativity, reputation;

(c) Participation in university activities: committee assignments, role in campus organizations;

(d) Administrative responsibilities;

(e) Outside professional activities: consulting, serving as a reviewer, public speaking.

A number of the individual items associated with the first three categories were selected because in the Davis campus study (Childebrand and Wilson, 1971) the items were shown to discriminate between good and poor teachers.

Political Considerations

It was apparent to the committee that any attempt to implement a project with the scope and potential impact of a full scale evaluation program would generate considerable discussion and controversy, especially in freedom-oriented university setting. Before any of the details of the proposed evaluation procedures were distributed to the university community an attempt was made to anticipate the problems or issues likely to be raised. On the basis of these "political" considerations the following ideas were stressed in presenting the evaluation program to the university community.

1. The privacy of individuals would be protected. Public distribution of teacher evaluations would not be allowed without permission of the faculty member involved.
2. The evaluation procedures were regarded as experimental. Both the form of the instruments and details concerning their implementation were not in any sense fixed but were to be decided on the basis of feedback from the university community.
3. It was noted that evaluation was currently taking place at all levels in the university, and that the purpose of the evaluation instruments was to "make more objective and explicit the processes of evaluation already at work in the university and to provide a process of gathering a more complete range of information concerning faculty members and administrators in their work" (TCU Committee

Report, 1971).

4. Open hearings on the evaluation procedure were held by the faculty senate with the evaluation committee answering questions and recording suggestions for changes.
5. The validation study (to be described below) gave each individual faculty member and administrator the chance to comment on the questionnaires in a constructive (or non-constructive) manner and insured that if job requirements or teaching styles differed across departments or other divisions of the University, this diversity would be noted.
6. Considerable attention was given to matters of protocol. Representatives for various student and faculty groups were kept informed of the committee's activities. Traditional lines of communication ("proper channels") were utilized in distributing and collecting information associated with the evaluation procedure.

THE VALIDATION PROCEDURE

Purposes and Administration

Although some of the questionnaire items were validated on the basis of previous research, many were not because it is difficult to find external criteria related to all of the behaviors being evaluated. Also, in many cases the behaviors described on the evaluation questionnaires represent the most meaningful criteria for defining outstanding performance, thus making it difficult to find associated external criteria. Finally, since it was anticipated that the patterns of behavior which characterize expected performance might differ across departments, some type of "face validation" study was deemed necessary to collect information on these differences.

The validation study was, therefore, intended to provide information on the perceived relevance of the items on the various questionnaires, not only for the purpose of differentiating between the various university groups but in addition to "validate" the individual items by demonstrating that their importance was commonly agreed upon. Also the validation procedure served as a communication device, informing the university community of the nature of the proposed program and providing the opportunity for some participation. Students, faculty and administrators were sent copies of all the evaluation instruments and asked to rate each of the items in terms of its importance or relevance for the position being evaluated. Thus, both students and faculty rated the importance of the criteria on the teacher evaluation questionnaire as indicants of good or effective teaching. Faculty rated the items on the colleague questionnaire for relevance with regard to their own departments.

Analysis of the Results

Perhaps the most surprising result of the validation study was that with the exception of the colleague questionnaire, the items on the various instruments received extremely high ratings. In fact, the average rating for all except several of the items on the teacher evaluation questionnaire and the administrator questionnaire was between "very relevant" and "extremely relevant" on the response scale. This result was not too unexpected since the questionnaire items were selected originally on the basis of judged importance to the position being evaluated, nevertheless it was reassuring to have the committee's opinions corroborated by the university at large.

Multiple discriminant analysis (MDA) was used to find the dimensions or factors on which the various university groups differ in their responses to a particular questionnaire. For example, if there was some disagreement between student and faculty as to what constitute the most relevant behaviors for excellent teachers, then MDA can be used to determine the extent of the disparity and to define the underlying dimensions. A number of researchers have used factor analysis to identify items which have similar response patterns across groups or individuals (Moore, 1970; Rees, 1969; Meredith, 1969; Hildebrand and Wilson, 1971). MDA techniques, however, identify items which have different response patterns across groups. With the exception of a single study by Field, Simpkins, Browne, and Rich (1971) discriminant analysis procedures have not been (to the authors' knowledge) used in the evaluation area.

Teacher Evaluation Questionnaire

MDA techniques were used to investigate the differences between student, faculty, and administrator responses to the teacher evaluation questionnaire.[2] In general, there was considerable agreement between the three groups as to the importance of the various criteria in defining good teaching. Three significant discriminant axis (dimensions of difference) were found despite the general agreement on the items. The first axis represented a "general factor with almost all questionnaire items having moderate or high projections. This axis reflects the fact that administrators and faculty generally gave higher importance ratings for all the items than did the students.

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[2] Details of this analysis are given in Appendix B.

The second axis discriminated between underclassmen (freshmen and sophomores) and all other groups (juniors, seniors, faculty and administrators). The dimension represented the instructor's enthusiasm or attention-getting ability. Items such as: "usually held your attention during class"; and "revealed enthusiasm in his teaching" were highly correlated with the axis. Evidently, the underclassmen considered stimulating teachers as more important than the other groups.

The third axis was defined by items concerned with the mechanical details of the course rather than the instructor. It was interesting to note that freshmen rated these items as considerably less important than did the other groups, while sophomores rated these items as considerably more important. As before, juniors, seniors, faculty, and administrators had similar ratings. While the results of this particular analysis are not terribly surprising, they do illustrate the potential usefulness of the discriminant technique in evaluation research.

Faculty Colleague Questionnaire

The faculty validation responses to the colleague questionnaire were divided by colleges into eight groups (divinity, business, education, fine arts, humanities, natural sciences, social science, nursing) and analyzed using a multiple discriminant procedure. The administrators represented a ninth group. The analysis yielded four significant discriminant axes which were interpreted as follows:[3]

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[3] Details of this analysis are presented in Appendix C.

1. Dimension 1: This is a bipolar dimension characterized on one pole by items that reflect the importance of research, and on the other pole by items that suggest a "good member of the university community" stereotype. Faculty groups who rated the dimensions as highly important are concerned with university committees ("works well as a member of a committee"), are involved in student and faculty organizations, are interested in students, and are not especially interested in research. Faculty groups with low loadings on the dimension rated the "good member" items as less important and the items related to research as highly important. The fact this dimension is bipolar is interesting for it suggests that, at least at TCU, faculty fitting the "good member" stereotype are not especially concerned with research and vice-versa. Analysis of the various faculty groups' loadings on this dimension revealed that the business school and school of education were high while the natural sciences and the social sciences were low. Table C1 in Appendix C lists the relative positions of the various schools on this dimension and the three dimensions presented below.
2. Dimension 2: This is a dimension concerned with the breadth of the faculty ("seems well read beyond the subject he teaches"), their creativity and their interest

in teaching. The humanities have, by a considerable margin, the highest score on this dimension followed by the divinity school and the administrators. The social sciences and the business school gave the lowest ratings for the items associated with this dimension.

3. Dimension 3: This axis clearly represents a "local visibility dimension" since highly correlated items were; "has done work with which you are familiar"; is an active participant in the affairs of the academic communities"; and, is recognized as an active citizen by the community. Groups with high loadings were the divinity school, fine arts, the social sciences and the administrators. Although no group gave this dimension a low importance rating, by relative standards the natural sciences and the business school had the lowest scores.

4. Dimension 4: This dimension represents a national visibility axis and is defined by such items as: "is asked to serve as a consultant to other organizations"; and, "has gained national or international recognition for his work." The natural sciences, fine arts, and nursing have the highest loadings on this dimension while the social sciences, the business school, the humanities, and the divinity school anchor the opposite end.

The MDA of the colleague questionnaire data substantiates an earlier prediction which was that different patterns of behavior are considered most appropriate in different departments or schools. The information derived from the analysis would be extremely useful if the colleague instrument were used as part of an overall evaluation program.

THE CURRENT STATE OF THE EVALUATION PROJECT

The paper thus far has dealt with the more academic aspects of the evaluation program, the development of the instruments and an analysis of the data obtained from the validation study. This is not the full story. As the reader might expect, the entire evaluation project, in particular the development of trial instruments and the validation procedures engendered considerable discussion throughout the university community. Although much of the debate was constructive, the emotional overtones of many of these discussions made it clear that there was considerable disagreement between various groups in the university as to whether there should be "objective" evaluation, who should evaluate whom, and what purposes an evaluation program could serve. The major issues of concern seemed to be associated with the following points:

1. By far the largest amount of criticism and emotion were directed at the colleague evaluation questionnaire. It was apparently a difficult instrument to complete because it required information of a sort that only a faculty member's closest colleagues would be capable of providing. Many people felt that implementing such procedure would be extremely bad for morale.
2. Many faculty apparently prefer the subjective evaluation of an authority figure, such as a chairman or dean, to

any kind of explicit, "objective" questionnaire. The possibility of appealing an unfavorable decision with the "objective" questionnaire data was not an important consideration.

3. Several faculty groups felt that because they were not represented on the committee that developed the instruments, important considerations were ignored. The dissentient groups were invited to send representatives to join the committee, and in fact, the individual from the business school raised some important issues concerning the managerial implications of an evaluation system.
4. One important argument against all the procedures was that they could do the faculty no good, but could cause harm. The faculty could not benefit from the evaluation program because the university budget was too tight to provide adequate rewards for outstanding performance; yet, some reprisal could be taken against the faculty members who received low evaluations.

After a careful analysis of the data collected during the validation study and the information obtained from the senate hearings and later discussions, the committee decided to drop the colleague evaluation questionnaire and instead substitute a rating form to be completed by department chairmen (and perhaps close faculty associates). Eliminating the questionnaire had an interesting effect on the overall evaluation program. There was very little left in the way of opposition to the teacher evaluation or other evaluation instruments. This was a little surprising since previous attempts to implement a teacher evaluation procedure had not met with general acceptance by the faculty. Although it was not deliberately intended, the colleague questionnaire served as the "apes hand"[4] in the evaluation system.

TCU has just completed (Spring 1972) a trial run of the entire evaluation procedure with very little commotion or controversy. The success of the trial run and the previous success with the validation study are probably dependent on two important aspects of the evaluation program. First, the Chancellor wanted the program developed. By providing the committee with both impetus and the necessary resources he made it possible for the committee's work to be effectively channeled through all levels of the University. The second important consideration was that everyone, faculty, administrators, and professional staff were evaluated. This eliminated objections which might be raised from groups singled out for evaluation (at many other universities, only the faculty are evaluated). Will the evaluation program accomplish its intended goals? We do not know. At least it is possible to collect the data. One office is completely filled and things are very quiet.

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[4] The ape's hand phenomenon refers to the behavior of an artist (historical reality unconfirmed) who painted for the Spanish aristocracy. Bothered by the fact that the king insisted on having one change made in each new portrait, the artist began painting an ape's hand into each picture. The moral is obvious.

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APPENDIX A. Instruments for teacher evaluation, colleague evaluation, and administrator evaluation

FORM A.1: TEACHER EVALUATION QUESTIONAIRE

TRIAL RUN FORM

Faculty Member____________________ Dept.__________ Course No.______ Year______ Semester________

Teaching Observed: Lectures___ Labs___ Conf.-Disc.-Sem.____ Other____________________
(give approximate number) (specify)

CODE
L - Low Score
BA - Below Average Score
A - Average Score
AA - Above Average Score
H - High Score
U - Undecided, Not Applicable

Listed below are a number of statements which describe aspects of instructor behavior. Rate your instructor on each of these items by marking the response category that best indicates his position in comparison with other teachers you have had. Rate each item as thoughtfully and carefully as possible. If you feel that you cannot evaluate the instructor on a particular item or that the item is not applicable for your class, then mark the response category labeled "undecided".

Evaluate your instructor in terms of the degree to which he:

SCALE 1. ANALYTIC/SYNTHETIC APPROACH

1. Discussed points of view other than his own	L	BA	A	AA	H	U
2. Contrasted implications of various theories	L	BA	A	AA	H	U
3. Discussed recent developments in the field and presented origins of ideas and concepts	L	BA	A	AA	H	U
4. Gave references for more interesting and involved points	L	BA	A	AA	H	U
5. Chose texts for the course which added depth to lectures and discussion	L	BA	A	AA	H	U

SCALE 2. ORGANIZATION/CLARITY

6. Was well-prepared for lectures or discussion	L	BA	A	AA	H	U
7. Used examples and illustrations which made the material clearer	L	BA	A	AA	H	U
8. Presented the material coherently, emphasizing the major points and making clear their relationships	L	BA	A	AA	H	U
9. Gave adequate instructions concerning assignments	L	BA	A	AA	H	U
10. Wrote test questions for which the meanings were usually clear	L	BA	A	AA	H	U
11. Usually returned assignments promptly	L	BA	A	AA	H	U
12. Paced the course so that he did not need to hurry over large amounts of material toward the end of the semester	L	BA	A	AA	H	U
13. Made efficient use of class time	L	BA	A	AA	H	U
14. Outlined clearly at the beginning of the course his expectations of the class and did not surprise you with major assignments at the last of the course	L	BA	A	AA	H	U

SCALE 3. INSTRUCTOR/GROUP INTERACTION

15. Usually was aware of whether the class members were following his discussion or lecture with understanding	L	BA	A	AA	H	U
16. Made you feel free to ask questions, disagree, and express your ideas	L	BA	A	AA	H	U

17. Gave tests which provided you with an adequate opportunity to show what you have learned L BA A AA H U

18. Taught at an appropriate level for the course L BA A AA H U

19. Explained clearly and early in the semester how the course grade would be determined L BA A AA H U

20. Stimulated you to work on your own beyond what the course itself required L BA A AA H U

21. Was fair and impartial in his dealings with students L BA A AA H U

22. Had sufficient evidence, in terms of class participation and written work, to evaluate your achievement in his course L BA A AA H U

23. Commented individually on your work, either orally or in writing L BA A AA H U

24. In his dealings with students seemed to respect them as individuals L BA A AA H U

25. Was available for conferences outside of class L BA A AA H U

SCALE 4. DYNAMISM/ENTHUSIASM

26. Usually held your attention during class L BA A AA H U

27. Was intellectually stimulating L BA A AA H U

28. Revealed enthusiasm in his teaching L BA A AA H U

OTHER IMPORTANT QUESTIONS

29. My classification is (a) Fr. or So. (b) Jr. (c) Sr. (d) Masters (e) PhD (f) Other a b c d e f

30. My overall GA is (a) A (b) B (c) C (d) D a b c d

31. Most of the instructor's tests were (a) objective with no individual writing (b) fill in the blank or short answer (c) essay (d) combination of all a b c d

32. The instructor drew the majority of his tests from (a) lectures (b) text (c) other reading material (d) equal combination of all three a b c d

33. Is the amount of work done appropriate to the credit hours received? (a) received more than course warrants (b) received the right amount of credit (c) received fewer than course warrants a b c

34. The size of the class was appropriate for effective presentation of material and for helping all participants to learn the subject matter: (a) class too large (b) class the right size (c) class too small a b c

35. Compared with all instructors I have had, both in high school and in college, this instructor was: (a) one of the best (b) above average (c) average (d) below average (e) far below average a b c d e

FORM A.2: FACULTY COLLEAGUE EVALUATION QUESTIONAIRE

TRIAL RUN FORM

Individual Evaluated:__________________________________ Department______________________________

On the average I have contact with him: Daily______ Weekly______ Monthly______ Bimonthly______ Occasionally______

CODE

L - Low Score
BA - Below Average Score
A - Average Score
AA - Above Average Score
H - High Score
U - Undecided, Not Applicable

Listed below are a number of statements which describe aspects of faculty behavior. Rate your colleague on each of these items by marking the appropriate response category. Your ratings should be based on a comparison between the particular individual and the other members of his department/division. If you feel that you cannot rate him on a particular item or that the item is not applicable for his work, then mark the response category labeled "undecided".

Evaluate your colleague in terms of the degree to which he:

SCALE 1. RESEARCH ACTIVITY AND RECOGNITION

1. Has gained national or international recognition for his work	L	BA	A	AA	H
2. Has done work with which you are familiar	L	BA	A	AA	H
3. Does original and creative work	L	BA	A	AA	H
4. Expresses interest in the research of his colleagues	L	BA	A	AA	H
5. Is actively engaged in research work or professional activities (not related to teaching)	L	BA	A	AA	H
6. Keeps current with developments in his field	L	BA	A	AA	H
7. Has done work to which you refer in teaching	L	BA	A	AA	H
8. Does quality work	L	BA	A	AA	H

SCALE 2. INTELLECTUAL BREADTH

9. Seems well read beyond the subject he teaches	L	BA	A	AA	H
10. Is sought by you or others for advice on research	L	BA	A	AA	H
11. Is sought by you or others for advice on academic matters	L	BA	A	AA	H
12. Can suggest reading in any area of his general field	L	BA	A	AA	H

SCALE 3. PARTICIPATION IN THE ACADEMIC COMMUNITY

13. Attends many lectures and other events on campus	L	BA	A	AA	H
14. Is involved in faculty organizations or committees	L	BA	A	AA	H
15. Is involved in campus activities that are associated with students	L	BA	A	AA	H
16. Is an active participant in the affairs of the academic community	L	BA	A	AA	H

17. Is someone with whom you have discussed your teaching	L	BA	A	AA	H	U
18. Expresses interest and concern about the quality of his teaching	L	BA	A	AA	H	U
19. Expresses interest or concern for the problems of students	L	BA	A	AA	H	U
20. Is available and willing to talk with students on matters of concern	L	BA	A	AA	H	U

SCALE 5. ASSOCIATED PROFESSIONAL ACTIVITIES

21. Discharges intra-university duties in an effective manner	L	BA	A	AA	H	U
22. Meets deadlines	L	BA	A	AA	H	U
23. Cooperates with others	L	BA	A	AA	H	U
24. Works well as a member of a committee	L	BA	A	AA	H	U
25. Follows through on committee work by appropriate actions and communications	L	BA	A	AA	H	U
26. Makes a positive contribution to the progress of his academic unit through committee participation	L	BA	A	AA	H	U

SCALE 6. PUBLIC SERVICE OR CONSULTING

27. Makes his talent and time available to the external community	L	BA	A	AA	H	U
28. Is recognized as an active citizen by the community	L	BA	A	AA	H	U
29. Serves his profession and community by service consistent with his primary obligation as a teacher-scholar	L	BA	A	AA	H	U
30. Is asked to serve as a consultant to other organizations	L	BA	A	AA	H	U

FORM A.3: ADMINISTRATOR EVALUATION QUESTIONAIRE

TRIAL RUN FORM

Individual Evaluated:______________________________ Position______________________________

On the average I have contact with him: Daily______ Weekly______ Monthly______ Bimonthly______ Occasionally______

I am: A student______ A faculty member______ An administrator______ A professional staff member______

CODE

L - Low Score
BA - Below Average Score
A - Average Score
AA - Above Average Score
H - High Score
U - Undecided, Not Applicable

Listed below are a number of statements which describe aspects of administrator behavior. Rate the above administrator on each of these items by marking the appropriate response category. In making your rating the administrator should be compared with other administrators at TCU that you have known. If you are uncertain about a particular item or feel that it is not applicable in describing the administrator's behavior then mark the category labeled "uncertain".

Evaluate the above administrator in terms of the degree to which he:

SCALE 1. COMMUNICATIONS

1. Communicates with you in a timely and responsive manner	L	BA	A	AA	H	U
2. Conducts decisive conferences and interviews	L	BA	A	AA	H	U
3. Balances and validates conflicting information effectively and fairly	L	BA	A	AA	H	U
4. Writes letters or makes statements that seldom need clarification	L	BA	A	AA	H	U
5. Is duly sensitive to your needs for information	L	BA	A	AA	H	U
6. Has sufficient contact with you	L	BA	A	AA	H	U
7. Shares important data willingly and in an organized manner	L	BA	A	AA	H	U

SCALE 2. DECISION MAKING

8. Makes sound and timely decisions	L	BA	A	AA	H	U
9. Gathers pertinent facts before acting	L	BA	A	AA	H	U
10. Consults with others on important decisions	L	BA	A	AA	H	U
11. Applies policy consistently and fairly	L	BA	A	AA	H	U
12. Strives to identify as specifically as possible all alternatives before making a decision	L	BA	A	AA	H	U
13. Is skilled in participatory decision making	L	BA	A	AA	H	U

SCALE 3. PLANNING

14. Plans ahead for those activities under his cognizance	L	BA	A	AA	H	U
15. Makes time for planning by delegating routine work	L	BA	A	AA	H	U
16. Keeps goals up to date and clearly stated	L	BA	A	AA	H	U
17. Is receptive to constructive suggestions for change	L	BA	A	AA	H	U
18. Encourages initiative and innovation	L	BA	A	AA	H	U

SCALE 4. OPERATIONS/ACTION

19. Initiates and sustains action toward defined goals L BA A AA H U

20. Assigns duties so as to maximize capabilities of those involved L BA A AA H U

21. Is skilled in those specialties demanded by his assignment L BA A AA H U

22. Appoints effective committees L BA A AA H U

23. Works well with committees L BA A AA H U

24. Sustains momentum of effort toward difficult goals L BA A AA H U

25. Has a sense of quality and standards L BA A AA H U

26. Encourages initiative and performance by delegating tasks effectively to others L BA A AA H U

27. Demonstrates a clear understanding of the role and scope of his assignments and responsibilities L BA A AA H U

SCALE 5. PROBLEM SOLVING

28. Is alert to potential problems because plans are not working out in practice L BA A AA H U

29. Is able to cope with unanticipated events L BA A AA H U

30. Gathers all pertinent facts before acting on a problem L BA A AA H U

31. Knows how to use the special talents of others as an aid to solving problems L BA A AA H U

32. Approaches problem solving on a systematic basis L BA A AA H U

33. Is able to arouse a spirit of dynamic response to a problem without alarming or depressing others unduly L BA A AA H U

SCALE 6. HUMAN/PUBLIC RELATIONS

34. Buoys morale and instills enthusiasm L BA A AA H U

35. Gives proper and generous credit to others for their contributions L BA A AA H U

36. Strives to help those under his supervision develop their full potential L BA A AA H U

37. Is available for counsel when needed and appropriate L BA A AA H U

38. Understands the university well enough to refer matters to the proper offices for effective action L BA A AA H U

39. Constantly strives to broaden both the internal and external perception of the goals and accomplishments of the university L BA A AA H U

40. Establishes rapport easily and is approachable for counsel L BA A AA H U

41. Takes positive steps to counteract destructive rumors L BA A AA H U

42. Commends positive results and does not harp about the negative ones L BA A AA H U

43. Inspires you with a sense of purpose and direction L BA A AA H U

APPENDIX B. Multiple discriminant analysis of the student, faculty, and administrator responses to the teacher evaluation questionnaire

GROUP	DISCRIMINANT AXIS		
	I	II	III
1. Freshmen	2.96	-0.38	-0.72
2. Sophomores	2.51	-0.24	0.72
3. Juniors	3.15	-1.36	0.10
4. Seniors	2.94	-1.58	0.18
5. Faculty	4.69	-0.81	-0.04
6. Administrators	4.85	-1.14	0.02

TABLE B1. Group means for the three significant discriminant axes from the analysis of the teacher evaluation questionnaire.

Item No.	Item Description	Projection
18	Taught at an appropriate level for the course	.76
26	Usually held your attention during class	.59
16	Made you feel free to ask questions, disagree, and express your ideas	.54
27	Was intellectually stimulating	.48
28	Revealed enthusiasm in his teaching	.46
6	Was well-prepared for lectures or discussions	-.47
1	Discussed points of view other than his own	-.61
29	Most of the instructor's tests were (a) objective with no individual writing (b) fill in the blank or short answer (c) essay (d) combination of all	-.88

Chi Square = 69 df = 28 $p < .001$

TABLE B2. Standardized projections of questionnaire items on the second discriminant axis.[5] Items with projections less than 0.4 were omitted.

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[5] The first discriminant axis is not presented since nearly all questionnaire items had large projections.

DISCRIMINANT AXIS

Item No.	Item Description	Loading
33	Compared with all instructors I have had, both in high school and college, this instructor was: (a) one of the best (b) above average (c) average (d) below average (e) far below average	.72
31	Is the amount of work done appropriate to the credit received? (a) received more than course warrants (b) received right amount of credit (c) received fewer than course warrants	.68
8	Presented the material coherently, emphasizing the major points and making clear their relationships	.58
32	The size of the class was appropriate for effective presentation of material and for helping all participants to learn the subject matter (a) class too large (b) class the right size (c) class too small	.57
30	The instructor drew the majority of his tests from (a) lectures (b) text (c) other reading material (d) equal combination of all three	.53
5	Chose texts for the course which added depth to lectures and discussion	-.46

Chi Square = 50 df = 36 $p < .01$

TABLE B3. Standardized projections of question items on the third discriminant axis. Items with projections less than 0.4 were omitted.

APPENDIX C. Multiple discriminant analysis of the faculty (by colleges) and administrator responses to the colleague evaluation questionnaire

Group (College)		Discriminant Axis		
	I	II	III	IV
1. Brite Divinity	1.57	2.75	4.04	0.69
2. Business	2.71	1.06	2.48	0.46
3. Education	3.03	2.01	2.85	0.85
4. Fine Arts	1.78	1.97	3.86	1.60
5. Humanities	1.57	3.47	2.41	0.64
6. Natural Sciences	0.95	1.86	2.40	1.49
7. Social Sciences	0.63	0.91	3.47	0.10
8. Nursing	3.27	1.90	2.83	1.61
9. Administrators	1.69	2.38	3.39	1.80

TABLE C1. Group means for the four significant discriminant axes from the analysis of the colleague evaluation questionnaires.

Item No.	Item Description	Loading
24	Works well as a member of a committee	.89
17	Is someone with whom you have discussed your teaching	.84
26	Makes a positive contribution to the progress of his academic unit through committee participation	.79
19	Expresses interest or concern for the problems of students	.78
25	Follows through on committee work by appropriate actions and communications	.77
20	Is available and willing to talk with students on matters of concern	.74
23	Cooperates with others	.74
14	Is involved in faculty organizations or committees	.74
15	Is involved in campus activities that are associated with students	.72
18	Expresses interest and concern about the quality of his teaching	.71
6	Keeps current with developments in his field	.71
29	Serves his profession and community by service consistent with his primary obligation as a teacher-scholar	.68
12	Can suggest reading in any area of his general field	.68
21	Discharges intra-university duties in an effective manner	.67
22	Meets deadlines	.65
1	Has gained national or international recognition for his work	-.67
5	Is actively engaged in research work or professional activities (not related to teaching)	-.93

Chi Square = 166 df = 37 $p < .001$

TABLE C2. Standardized projections of questionnaire items on the first discriminant axis. Items with projections less than 0.65 were omitted.

Item No.	Item Description	Loading
9	Seems well read beyond the subjects he teaches	.83
3	Does original and creative work	.62
18	Expresses interest and concern about the quality of his teaching	.53
13	Attends many lectures and other events on campus	.51
8	Does quality work	.51

Chi Square = 90 df = 35 $p < .01$

TABLE C3. Standardized projections of questionnaire items on the second discriminant axis. Items with projections less than 0.4 were omitted.

Item No.	Item Description	Loading
7	Has done work to which you refer in teaching	.76
2	Has done work with which you are familiar	.72
16	Is an active participant in the affairs of the academic community	.70
28	Is recognized as an active citizen by the community	
4	Expresses interest in the research of his colleagues	.61
27	Makes his talent and time available to the external community	.58
29	Serves his profession and community by service consistent with his primary obligation as a teacher-scholar	.57
8	Does quality work	.55
22	Meets deadlines	.51
6	Keeps current with developments in his field	.51
13	Attends many lectures and other events on campus	.49

Chi Square = 76 df = 33 $p < .01$

TABLE C4. Standardized projections of questionnaire items on the third discriminant axis. Items with projections less than 0.4 were omitted.

Item No.	Item Description	Loading
30	Is asked to serve as a consultant to other organizations	.73
1	Has gained national or international recognition for his work	.59
14	Is involved in faculty organizations or committees	.51
3	Does original and creative work	.50

Chi Square = 60 df = 31 $p < .01$

TABLE C5. Standardized projections of questionnaire items on the fourth discriminant axis. Items with projections less than 0.4 were omitted.

AN ASSESSMENT OF FACULTY PERFORMANCE: SOME CORRELATES BETWEEN ADMINISTRATOR, COLLEAGUE, STUDENT, AND SELF RATINGS

Robert T. Blackburn*
and
Mary Jo Clark

ABSTRACT

The study examines the uncertainties surrounding the evaluation of faculty work performances and the concerns faculty have regarding assessments made by them. Separate evaluations of teaching effectiveness and overall contribution to the college for 45 full-time (85% response rate) faculty members were collected from administrators, faculty colleagues, students, and from the professors themselves.

The very low correlations between the professor and each of his role sets are discussed. The intercorrelations are also examined for their implications. Suggestions are made for improving the evaluation of faculty performance and for mitigating the academic man's uncertainties on vital matters affecting his career.

Faculty complain more about the manner in which their work is judged and rewarded than about any other dimension of their professorial role (Guthrie, 1949; Theophilus, 1967). Faculty fret over tenure, promotion, merit increases. Most often they believe that deserved honors come too late, if at all.

Nor is their anguish surprising. Most academic men sincerely believe they are performing at higher levels than those for which they receive

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institutional and personal recognition. Furthermore, professors can document their frustrations with respect to the assessment of their worth -- ignorance on the part of the evaluators (Gustad, 1967). Those who pass judgement seldom witness a performance.

THE PROBLEM AND ITS BACKGROUND

Teaching

Teaching is the professor's dominant task and principal activity. He gives teaching highest priority, as does his college (Cartter, 1967). In addition, teaching is his greatest source of pleasure (Gaff and Wilson, 1971: 195).

But how is his pedagogy to be judged when there is still no acceptable definition of "good" teaching (McKeachie, 1967-1970); Biddle and Ellena, 1964; Rothwell, n.d.). Furthermore, chairmen and deans -- even his peers -- never see him teach. Even if student evaluation forms are used and available to administrators, deans will not publicly claim that those who are in the role of apprentices are qualified to judge those who have credentials (Kent, 1967). Some faculty sincerely and vociferously protest student evaluation (Bryant, 1967; Hildebrand, 1972). Clearly, precious little if any scientific data are in hand when judgments on their teaching performance are rendered. So, faculty can point to a violation of Academe's first principle: valid and reliable evidence for reaching conclusions.

Research

Scholarly output is supposedly a more objective dimension of professorial value. At least assessing publications can be done. The extent to which it is actually performed remains debatable. Besides, inferring teaching effectiveness from research productivity remains precarious. First of all, expert opinion differs widely. Two quotations capture the beliefs that divide faculty, administrators, and students:

> Teachers cannot remain stimulating unless they also continue to learn, and while this learning may not focus on small, manageable "research problems", it is research by any reasonable definition. When a teacher stops doing it, he begins to repeat himself and eventually loses touch with both the young and the world around him.

> So says Jencks and Riesman (1968). But John Fischer (1968) asserts:

> "The standard defense for this emphasis on research is that man cannot be a good teacher unless he is constantly learning something new; in theory, research and teaching go hand in hand. But in practice, they don't."

The Relationship of Teaching to Research

The few studies conducted on the relationship between research and teaching show either no relationship or at best a slight positive association. At the University of Washington, Voeks (1962) found very low correlations. Publishing and effective teaching do not go hand in hand; however, neither do they conflict. In an unpublished paper of preliminary findings at Purdue University, Feldhusen and McDaniels (1967) found nine correlations between different statements on teaching effectiveness and faculty productivity that fluctuated almost exactly around zero. At Kansas State University, Hoyt (1970) found no significant correlation between faculty publications and teaching effectiveness. Also, Hayes' (1971) investigation at Carnegie-Mellon University yielded low relations between these variables although other interesting findings on administrator ratings of faculty were uncovered.

On the other hand, other contemporary investigations report small, positive correlations. At Tufts University, Bresler (1968) discovered a positive association between student judgement of teaching effectiveness and the professor's possession of a research grant. At the University of Illinois, Stallings and Singhal (1969) obtained small but significant correlations (r approximately .25) between productivity as measured on a publication scale and student ratings of teacher effectiveness. While the positive relationships was true for all ranks, the higher ranked professors also had higher productivity and higher student ratings. In a second study done at Purdue University, McDaniels and Feldhusen (1970) did find a positive relationship between faculty ratings and indices of scholarship when scholarship is measured in an indirect way (being second author in a major publication). However, their other and numerous measures of productivity correlated close to zero with their ratings as teachers.

Finally in pilot investigations at the University of Wisconsin and at Stanford, Hammond, Meyer and Miller (1969) found students and faculty disagree about teaching effectiveness and its relationship to research. They speculate that the reason the correlations may hover around zero is due to the fact that faculty judge a colleague to be a good teacher if and only if he is doing research. Meanwhile, students believe that the teacher who is poor in the classroom is so because he is spending all of his time on research, and vice versa. Thus, faculty and student interpretations of the performance of a professor are on perpendicular axes. Their untested hypothesis could account for the low relationship most have obtained.[1]

Agreements Between Evaluators

Administrators and faculty members persist in assuming a positive relationship between teaching and research as they make judgements about promotions, tenure, and salary increases. Even the professor assumes a single conception of academic worth which specifies that if a colleague is doing research, his classes are ipso facto superior. Yet Hussain and Leestamper (1968) discovered the criteria used for judging teaching effectiveness by students and administrators were not the ones given most importance by faculty. In fact, those that faculty thought most important were not even on the list. In a study by Crawford and Bradshaw (1968), each of ten subgroups -- assistant professors and instructors, associate and full professors, department chairmen, deans, and six student groups divided by sex and three levels of ability -- differed in a statistically significant way from all other sub-groups in the rating given to the most important characteristics of effective university teaching.

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[1] Service, the last of the troika of faculty roles -- committee work, advising, community relations, professional assistance from expertise -- remains even more subjective. The value placed on it is uncertain. Equally, uncertain is the way it is assessed by those who reward faculty. The ambiguity increases faculty apprehension regarding those who hold power to sanction. The service role is not discussed in this research.

Birnbaum (1966) found inconsistencies in faculty evaluation at the community college level.

Promotion and Merit Raises

Finally, two studies underscore the faculty's genuine concern on how they are assessed and rewarded. Luthans (1967) revealed that while deans, department chairmen, and other administrators believe that teaching is the most important function for faculty, and that faculty agree, administrators confess that promotion is judged on other criteria, e.g., research. However, Luthans found no relationship between research and promotion. Similarly, Hoyt (1970) uncovered no significant relationships between either rate of promotion or receipt of merit raises with either teaching effectiveness or publication record. He did find differences between academic disciplines and a slight indication that above average raises are more clearly related to teaching effectiveness at the early stage of a man's career and to publications at a later stage.

So, faculty are not schizoid when they complain about matters of recognition for their efforts. Whether they are judged well or poorly matters, of course. Equally important, however, is their firm conviction that they are not judged properly.

Improving the assessment process is therefore extremely important. Sorting out fact from folklore as well as from unfounded belief is the first step.

While several studies of faculty teaching effectiveness have utilized student evaluation, and a few have used peer ratings, this research combines these two sources and introduces both administrative and self-evaluations. It also expands the notion of faculty work performance so as to include dimensions other than teaching effectiveness, and publications. A Global rating on overall contribution to the college serves as independent measure. The findings provide rich insight into faculty values. The unexpected results also have serious implications for behavior within academia.

SETTING AND METHODOLOGY

The study was conducted at "Midwest" college. Her fifteen hundred students encompass a full range of interest and academic qualifications. A moderately well-trained faculty spreads over the typical departments. While the participation from the approximately twenty-five part-time faculty was respectable, other factors led to restricting the analyses to full-time faculty. Forty-five of the fifty-three faculty (85%) in the latter category responded to all measures.

As Midwest grows, she is experiencing a separation from her founding church both in support and in control. In these and other ways Midwest is like many other American colleges and is nearly dead-center with respect to her cohorts of more than eight hundred private and church-related liberal arts colleges. And, as the principal faculty roles are teaching and contributing to the organization, Midwest is not unlike many emerging state colleges and universities except, of course, with respect to size.

Having convinced themselves that self-analysis was necessary for major change, Midwest faculty willingly participated in a series of self-studies. Among other things, they rated colleagues and themselves on teaching effectiveness and overall contribution to the college. Midwest's administrators also rated faculty members on both dimensions of performance. Student evaluations of teaching effectiveness were also obtained. A sample of faculty participated in a second set of ratings to provide an estimate of measurement reliability.

Specifically, each faculty member rated every other teacher in his curricular division and himself on a five point scale of "teaching effectiveness." Administrators also rated faculty. In doing so, the faculty member was told to "consider those qualities which are important in the evaluation of the skills and practices and products of a _classroom_ _teacher_ regardless of rank or experience or teaching of the person being rated." In a similar way, each faculty member judged himself and each colleague on a five point scale concerning his "overall contribution" to Midwest College. Again, administrators rated faculty. The rater was told to "take into account the person's total contribution, whether his own work or his stimulation of others, whether scholarly or administrative or in human relations; the person's overall usefulness in helping the college carry out its responsibilities."

Student evaluations of teaching effectiveness were obtained from a standard 14 item, five point scale questionnaire to evaluate all courses each semester. Responses to the question "How would you rate your instructor in teaching effectiveness?" were averaged across all courses taught by a faculty member during one semester for an index of his teaching performance as judged by students.[2]

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[2] Cartter's (1966) methodology is employed. Expert judgements on what in essence is quality, an attitude of value, are used. An intensive analysis was conducted to establish the reliability and validity of the technique. The successful effort is reported in considerable detail in another paper (Clark and Blackburn).

RATED TEACHING EFFECTIVENESS AND RATED OVERALL CONTRIBUTION TO THE COLLEGE AS EVALUATED BY PROFESSORS, ADMINISTRATORS, SELF, AND STUDENTS IN CLASSES

	Professors		Administrators		Self		Students
	Teaching (N=45)	Contribution (N=45)	Teaching^{a} (N=29)	Contribution^{b} (N=45)	Teaching (N=40)	Contribution (N=41)	Teaching^{c} (N=45)
Professors							
Teaching	(.72)						
Overall Contribution	.488*	(.86)					
Administrators							
Teaching^{a}	.625*	.243	( )				
Overall Contribution^{b}	.165	.544*	.429*	( )			
Self							
Teaching	.278	.335*	.098	.126	( )		
Overall Contribution	.333*	.450*	.065	.146	.723*	( )	
Students							
Teaching^{c}	.620*	.240	.466*	-.036	.187	-.070	( )

*Correlations are significantly different from zero at or above the 95% level of confidence.

a. The administrator rating on teaching effectiveness is the mean of ratings by the appropriate division chairman and by the academic dean.

b. The administrator rating on overall contribution to the college is the mean of ratings by the president, academic dean, and assistant dean.

c. The student rating is a mean of course evaluation responses to the question: "How would you rate your instructor in teaching effectiveness?"

FINDINGS

The intercorrelations are collected in Table 1. To begin with, different ratings on the two performance dimensions demonstrate discrimination was made between teaching effectiveness and overall contribution to the college by the same group of raters. Secondly, the rated teaching effectiveness correlates significantly with similar ratings by administrators and students. (The correlation between administrator and student ratings on teaching effectiveness, although lower (.47), is also statistically significant). However, among self-ratings, only colleague ratings on overall contribution to the college demonstrate a significant relationship. Even that is only 0.33. Self-ratings on teaching effectiveness have near zero correlations with ratings with each of the other three groups of raters.

Said another way, professors appear to view their own teaching effectiveness and overall contribution to the college in nearly interchangeable ways ($r = .72$). Their performance on one trait is viewed as being much like their performance on the other. At the same time, they make clear distinctions between the two traits when rating their peers. There is little commonality between self-perceptions of teaching effectiveness and judgements on this same dimension by colleagues, students, and administrators (0.28, 0.19, and 0.10 respectively). There is, however, fair agreement among the three independent groups of raters (.63, .62, and .47). There is agreement between self and colleague on overall contribution to the college (.45). However, between self and administrator ratings on this dimension -- the key relationship for the faculty member's concern, the correlation is very low, 0.15.

CONCLUSIONS

Conclusions from the data are that:

1. Apparently, there is considerable variation in the factors that enter into performance judgements as they are made by colleagues, students, administrators, and self.
2. Self ratings on the same performance dimensions show little agreement with ratings made by faculty colleagues and almost no relationship with judgements made by administrators.
3. Colleague judgements about teaching performance are positively related to their judgements about professional productivity of a faculty member.
4. Colleague and student judgements about teaching performance are in substantial agreement.

On the one hand, the data support the use of ratings by both colleagues and students in the evaluation of faculty performance. But, on the other hand, they demonstrate a reason why an individual faculty member often claims that his work is properly appreciated. Furthermore, this feeling is most likely to arise when decisions about his future are being made primarily by administrators, for his perception of his performance shows the least relationship to their judgements. The professor lives with an erroneous perception of how others perceive and assess him.

DISCUSSION AND IMPLICATIONS

Such a striking outcome evokes a natural response, "Why?" Immediate explanations are wanting. The chasms which separate perception of self from all significant others flaunt a basic premise I hold dear when conducting my daily life. I truly believe I know how I am doing, especially on matters which mean the most to my existence -- say, teaching. Maybe others do not, but I certainly do. To psychologically accept the conclusion that I err here is anything but easy.

One defense questions the findings.

The reliabilities of the instruments have already been presented.[3] The generalizability of the findings come into question, the possibility that "Midwest" is after all unique. Dissertation Abstracts reports three studies, (Choy, 1969; Morgenstern, 1969; Basham, 1970) in Colorado which corroborate the general findings here -- significant correlations between students, faculty, and administrators on teaching effectiveness and non-significant outcomes between self and all others. Hence, this recourse strengthens rather than weakens confidence in the outcomes.

A second category of possible explanations raises questions with respect to the validity of the instruments, the student evaluation of teaching effectiveness, for example. Are student ratings not influenced by grade received, happiness more than learning, a halo effect, ... a long list? Recent reviews of the extensive research on this topic by Blackburn (1971), Costin (1971), and Hildebrand (1972) dispel this outlet. Student ratings are highly reliable and free from contaminations.

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[3] Self-ratings are the possible exception. They are single measurements and, therefore, with lower reliability than the mean ratings used to represent judgements by colleagues, students, or administrators. The effect of this difference is an unknown quantity in the statistical analyses.

In addition, earlier Maslow and Zimmerman (1956) found nearly identical correlation coefficients between student and faculty colleague rating of teaching effectiveness, .69 as compared to .63. Their research at a New York University supports rather than questions the findings at Midwest.

Another approach to challenge the principal finding inspects the sources of information each role set has and does not have for making judgements with respect to faculty performance. While more speculative than documentable -- and hence, as hypotheses for research rather than fact -- this analysis sheds some light on the unexpected results.

To begin, with respect to a professor's teaching effectiveness, students, of course, have direct experience. Only small random errors affect their rating scores. Faculty, on the other hand, almost always have only indirect observations of a colleague's teaching ability. No doubt they have overheard him while walking down the hall, or momentarily have seen him performing as they passed by a window. In some instances, they may have attended a public lecture of his, or more rarely, co-taught a course with him. However, even at best, these observations constitute a small sample of a professor's time in class, most likely a non-random sample. They might, however, be an adequate measure if the man to be judged utilizes but a single style from the large repertoire of available teaching techniques.

Students supply faculty with other information about their colleagues. Overhearing an exchange between a professor and a student is one source. Academic counseling with respect to current work or future courses is another, a function which sometimes triggers an advisee's unsolicited comments about a colleague (not infrequently causing embarrassment and raising questions of professional ethics when a student expects a favorable acknowledgement after delivering a tirade). What kind of examinations and papers a professor gives and the way he grades frequently become "known" through students, even when not sought.

Also, professors chat about their peers, especially about their reputation. This secondary source becomes more detailed in the case of a colleague who stands at either of the extremes of the pedagogical scale. No doubt the "average" classroom performer commands less gossip.

Finally, inferences are drawn about a man's teaching effectiveness on the basis of person to person interactions with him -- on committees, in faculty meetings, socially, what he writes, in a whole host of ways. What factors determine judgements are not really known. One study (Isaacson, McKeachie, and Milholland, 1963) found the highest correlation with respect to peer (psychology teaching fellows in this case) rating of teaching ability was with their assessment of the man's cultural sophistication. Maslow and Zimmerman (1956) acquired a correlation of .77 between faculty ratings of colleagues on teaching effectiveness and their judgement of his creativity.

No doubt faculty assessment is made on the basis of all of the factors and experiences just delineated, as well as on others. Most likely, however, the last mentioned -- person to person interactions -- dominates, unless student and/or reputational feedback is overwhelming. Consequently, there are persuasive grounds to expect the high correlation found between student and faculty ratings of teaching effectiveness, however, what has been described thus far gives no compelling reasons for believing that the correlation between a man's peers and himself should be of any particular value -- positive, negative, or zero.

Turning to the bases on which administrators form opinions on a professor's teaching ability, student input on faculty is anything but random. Extremes predominate. Department heads and deans will learn who the very popular instructors are from student talk. But the student who makes an office call seldom does so to praise a professor. Only when students have been unable to resolve grievances farther down the line do they speak directly to administrators about the teaching practices of a professor. He is seeking redress from an unfair grade, an intolerable required class, matters on which he heaps the principal blame onto the instructor. His teaching is anything but praised.

Administrator information about faculty, who themselves are only partly knowledgeable about a professor's teaching effectiveness, must be distorted, even on those rare occasions when it exists. Faculty don't ordinarily talk with deans about a colleague's teaching ability, except as a member of a personnel committee deliberating promotions. Similarly, information from lower level administrators contains a large noise factor.

In all, then, it is not surprising that the correlations between administrators and both students and faculty are lower than those existing between the two constituencies who are closer to the professor. Also, that the correlation is positive is to be expected. However, of what magnitude it has is unpredictable from anything but an ex post facto analysis.

As for the man himself, some events suggest him to be an outstanding judge of his teaching effectiveness. Others indicate just the opposite.

For example, the majority of his student interactions are with those who hold him in high esteem. It is the students who like his course and his teaching that come after class, continue discussions in the hallways, join him for coffee, drop into his office, become his majors. The indifferent and despisers, no matter what their proportions in relation to the true believers, give him no feedback. Why should they bother? Hence distortion in self-appraisal follows from the non-randomness of the feedback.

The possibility suggests itself that the more mature academics would be more discriminate in judging themselves, especially those who had enjoyed some measure of success. They would better know their strengths and weaknesses than would those earlier in their career. The data, however, did not reveal such differences. (The sample size did not permit tests of refined subgroups. This hypothesis needs to be tested in a larger setting).

Another dimension enters when it is recalled that the primary reason a man chose to become a professor was because he wanted to teach. Furthermore, he believed he would be good. He established some performance goals and judges himself on self-selected standards. Failure in teaching effectiveness is failure in life; no inconsequential outcome.

As Goffman (1959) demonstrates, the management of self is vitally important. How I present myself to significant others can confuse others as well as myself. Do I take a class out on the lawn in Spring to show students I have not passed the generation gap? Do I mention to colleagues some outstanding term papers I have received to indicate I extract the best from students? Do I show that I have high standards by publicly expressing my disappointment in how poorly a class did on an examination? Do I exchange pleasantries with the Dean at a concert to be certain he knows I attended, or because I genuinely like him and naturally interact or both?

Sure, I too wear one of Pirandello's masks. Doesn't everyone? After all, there is a limit to how much the self can take. But all false images aside, I know who I am. I know how I am doing.

Why self correlations hover around zero becomes less surprising as professorial roles are examined. Nonetheless, the consequences of near zero correlations lessen not at all. Before turning to these, a similar but briefer analysis with respect to overall contribution to the college is presented.

As for colleague ratings, again meetings and committees and the like predominate. Unlike the case of teaching effectiveness, administrators now have direct evidence as they join with faculty as colleagues in the efforts. Negative feedback drops at the same time they mentally note who gets elected to what committees. A professor's support for a proposal of theirs will be known, as will be the frequency with which a professor comes forward with new ideas for the good of the college. The expectation would be that colleagues and administrators would tend to agree in their ratings of a man's overall contribution to the organization, as they do.

Lastly, what information does the man receive and how reliable is it? In what ways does he respond to favorable feedback, to negative?

For example, should he view his appointment to the library committee as praise, or as failure, or neither? Is he there because he orders more books than all others and they need his expertise? Or is he on this low status committee (everybody has to be on at least one) because he has been judged unworthy to influence educational policies?

Put another way, I know good teaching is my college's highest value. I work hard at it, very hard. I acknowledge that some of my peers are more dynamic, outstanding showmen. In fact, I am jealous, envious. I wish I had their performance talents. But then, I tell myself, genuine teaching is more than a good show. I know that. So do students, faculty, and administrators, really. My style may be lacking in glamour, but I really care. Sure, some days are better than others. Likewise, for some courses. But, and this is all that really matters, my students genuinely learn from me, more than they do from any colleague, actually -- bar none.

But, I have one flaw. I do not know that the correlation between my judgement on my teaching effectiveness and each of my other constituencies is essentially zero. I see my teaching effectiveness as highly correlated with my overall contribution to the college. Little do I know that my opinion correlates .15 with the boss.

The implications are many. For example, in essentially zero correlations, there is a random scatter of points on a chart plotting self and others' judgements. A complete scatter means a few individuals perceive themselves as others do. However, most do not. Furthermore, there is no way to predict who does and who does not. So, even those who are accurate don't know they are.

One of the extremes is the individual who rates himself at the top and others score him at the bottom. He has a very long fall when the message arrives that he is being let go -- and everyone else thinks he should be. That he is persisting in such a state of misperception is frightening.

Nor is the other extreme any less awesome, both from a human and from an organizational point of view. Since such a professor resides in ignorance of the fact all others judge him outstanding, or if told, he believes not a word, the man who has judged himself a failure will either resign or act to alter his ways drastically. In the eyes of all others, the latter decision can only move him downward. Again, the outcome of ignorance overwhelms.

What should be done?

Social scientists deal with such discrepancies in perception in a variety of well known ways -- information exchange, T-groups, performance appraisals. Such procedures are our recommendations, too, but with warnings.

For example, research on performance appraisal practices comes from business and industry. Meyer, Kay and French (1965) and French, Kay and Meyer (1966) uncovered some of the factors which can alleviate the unsatisfactory results General Electric was having. However, the practice has not spread, despite its intuitive attractiveness, an indication of troubles remain. Now performance contracts are the talk in higher education. Risk is involved. Care must be exercised.

At any rate, students, faculty and administrators might sit down and inspect the data. Communication lines have not been established that make clear what it is that is expected of a professor by each of the sub-groups --to say nothing of whether or not any human being can satisfy people who have very diverse, even conflicting demands. Conversations regarding expectations are the very least that must be done.

Too often colleges and universities assess the faculty member just before an important decision with respect to his and the institution's future must be made. The Personnel Committee meets in December before AAUP deadlines; this is its first meeting on a man. A negative judgement at that time leaves no alternatives. No corrections can be made; no learning takes place. Not only is such a procedure psychologically harmful to all parties; it also is contrary to the aims of the institution as a human organization.

In those few colleges and universities where assessment of faculty is a regular process (as opposed to a final judgement), evaluation devices are not tests and/or final examinations on which all hinges. When improvement of teaching is the aim, then the institution is an educational rather than a punitive one. Faculty visit other faculty's classes, and have their own observed. Coffee afterwards allows immediate reaction.

Student opinion is sought along the way and openly shared, not done in the absence of the professor in sealed envelopes unavailable until grades are in at the close of the term. When continuous evaluation is practiced, it appears that professional effectiveness increases and faculty growth occurs. Certainly such processes can mitigate the uncertainties and frustrations haunting many faculty when their efforts are assessed.

EPILOGUE

We would be less than honest if we did not append a haunting dream. There are, after all, some very fine humanists who chuckle at the surprise we express in our findings and at our recommendations for action. Unenamored by correlation coefficients of any magnitude, and generally deploring any fractionalization of the human whole, they knew the scientific establishment was bound to fall, as it has. That social scientists likewise perform no miracles surprises them not at all.

After all, long before Lear and well after Willie Loman, the humanists have captured the essence of the human condition -- tragedy. The very essence of tragedy, of humanity, is the unalterable inability of the individual to perceive the world as she views him.

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